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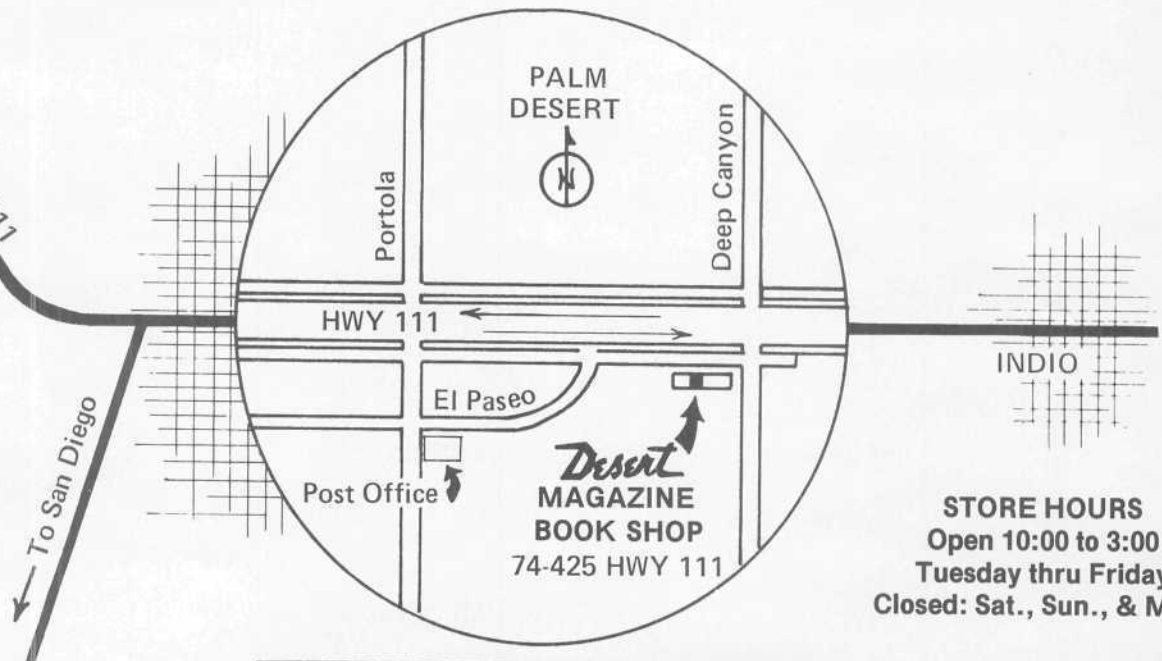
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THE COVER:
Prickly pear bloom, Valley
of Fire State Park, Nevada.
See article on Page 16.
Photo by David Muench of
Santa Barbara, California.

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THE ANZA-BORREGO DESERT REGION A Guide to the State Park and the Adjacent Areas

By Lowell and Diana Lindsay

At last a current and comprehensive guide to Southern California's most popular desert playground has been written. There has long been a need for such a guide to the Anza-Borrego/Yuha Desert, which annually receives more than a million visitor-use-days. This area, much of it wilderness, covers a third of San Diego County and portions of Riverside and Imperial counties from the Santa Rosa Mountains to the Mexican Border.

In its more than a million acres, about equally divided between the Anza-Borrego Desert State Park (the nation's largest state park) and BLM's Yuha Desert Unit (containing the site of possibly the earliest human remains in North America), the Anza-Borrego region appeals to a broad range of outdoor enthusiasts: backpackers, dune-buggy drivers, hikers, horsemen, nature seekers and campers.

From prehistoric Indians through weekend vacationers, men have called this desert home, some for all of their time, others for some of their time. From piney mountain crags to a windy inland sea, a rich variety of desert plants and animals dwell, in terrain and landforms as different as their inhabitants.

The book contains a large foldout map, providing an overall view of the region, and also detailed maps showing the most popular hiking and backpack areas. A section on arid-area travel and special precautions adds to the desert explorer's enjoyment and safety. Sixty-five trips along 700 miles of jeep trails, paved roads, and hiking routes are described, giving details of over 300 points of historic and natural interest.

The guide was written in cooperation with the California Dept. of Parks and Recreation, the Anza-Borrego Desert Natural History Association and the U.S. Dept. of the Interior, Bureau of Land Management (BLM), Riverside District Office.

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A Peek in the Publisher's Poke

SPRING IS a wonderful season to enjoy the desert Southwest. The days are warm and the evenings cool, and it's wildflower time. Oh, the visual feast, rainbows of color, varieties galore—what a challenge to the photographer, be he amateur or professional.

In this issue, Bill Jennings extols on the low desert area in late spring and its points of interest. K. L. Boynton shows us what an important part the pinyon tree plays in the balance of Nature, and Charles Taliaferro does a treatment on Mitchell Caverns and the Providence Mountains.

On the historical side, Herman Ronnenberg elaborates on an old Mexican fort in California's Imperial Valley. It had a very short life, but is being reviewed archeologically by a dedicated group from the Imperial Valley College Museum, whose ultimate goal is the restoration of the fort. Eric Moody takes us back in Nevada's history as he tells of Pyramid Lake's lost sister, another waterway that died into an alkali sink.

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New Mexico's pueblo of Tsankawi is reviewed by James Leonard, while Helen Walker journeys to Nevada's Valley of Fire State Park. Dick Bloomquist continues his series on the palm oases in California, and Stella Hughes tempts the taste buds with ox-tail stew.

The combination of a lost mine, a lost ledge, a disappearing old prospector, possible claim jumping, political shenanigans all make for great reading by Harold Weight. He brings us the first of two tales of a man who lost two mines—and his life.



Stella and her chuckwagon on the way to Washington, D.C.

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Yellow-rumped Warbler

One of Desert's favorite projects is the Living Desert Reserve, located right here in Palm Desert. This 900-acre area is being carefully developed into a unique facility for the interpretation of our native plants and wildlife. This month, Karen Sausman, Director of the Reserve, initiates a "Hotline" column to keep us informed of what's happening in her "Living Desert." Her feathered friends take top billing with the opening of the new walk-through Lilian Chase Aviary.

William Hughes

POTTERY TREASURES

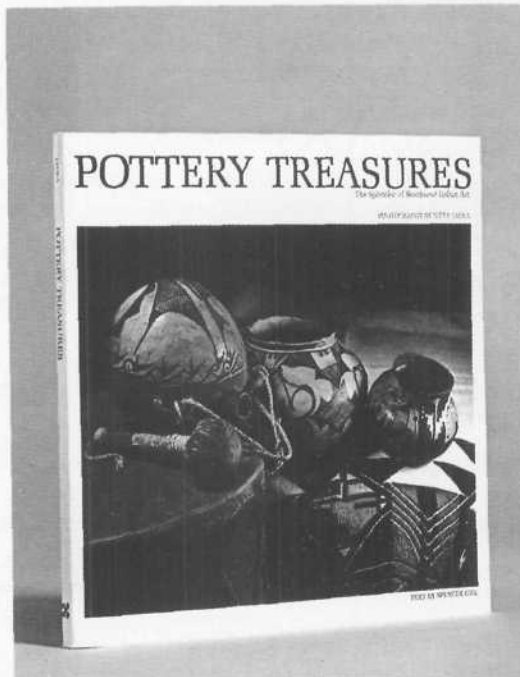
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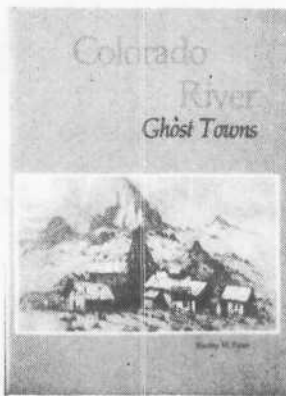


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Colorado River Ghost Towns

By Stanley W. Paher



The skeletal remains of abandoned mines and towns in the Cerbat Mountains and other barren ranges in western Arizona along the Colorado River are visited by the author. Lavishly illustrated with rare old photos. Large format. Standard edition is \$2.95.

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Books for Desert Readers

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MONO DIGGINGS
Historical Sketches of
Old Bridgeport, Big Meadows
And Vicinity,
Copiously Illustrated

By Frank S. Wedertz

One of the seldom remarked corners of the California gold country is the vast mountain and desert region of Mono

County, and the adjoining Nevada territory of Esmeralda County. Close to more famous Virginia City, Tonopah and Goldfield, the old placer and hard rock prospects of Aurora, Masonic, Monoville and, to a certain extent, even Bodie, are not as well known.

But mining was only part of the extensive history of this Eastern Sierra Wonderland, as the present booming tourist visitor and summer business mecca is called in publicity releases. Cattle and sheep raising, lumbering and just plain hell raising were as much a part of the Mono country's long history.

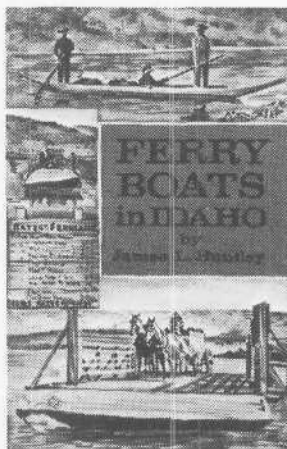
Author Wedertz has the advantage of belonging to one of Bridgeport's most famous merchant families and many of his kin have also served the county in many elective and appointive political capacities. Therefore, his book has the authentic stamp of history as told by one who either made some of it himself or is descended from those who did.

The region pre-dates the Gold Rush, of course, because of its geographic location as one of the early but most rugged fair-weather crossings of the Sierra. Also the presence of Mono Lake has assured the county of a rightful place in the history of California.

John Bidwell's pioneering colonization and exploration expedition of 1841, one of the first major overland treks in Mexican California, brought him up from Humboldt Sink via the Carson and Walker rivers to what is now the Big Meadows-Bridgeport valley of Mono County, but he followed two of the major mountain men by more than a decade.

The first non-Indian visitor to Mono County appears to have been Jedediah Strong Smith, whose arduous journey into and out of California in the 1820s included a sashay through the Mono Basin country in perhaps 1827, although Smith left no accurate journal of his feat. His party of fur trappers entered California along the Colorado River from Utah but left, at the urgent request of the Spanish-Mexican authorities, via the Sierras, somewhere between present-day King's Canyon and perhaps Beckworth Pass northwest of Reno. Some say he went through the Leeving-Bridgeport gap, but who knows for sure?

Author Wedertz makes a case for his region and also for Joseph R. Walker, for whom Walker Pass and the twin forks of the Walker River are named. Walker fol-



ISBN 0-87004-263-7 **Paperbound**
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Here is the first lengthy account of the water transportation system, such as it was, that served Idaho from the time of Lewis and Clark until the present. Even before the coming of the white man, the native peoples of the Gem State knew the many great rivers in their land and how to cross them. This is the story of the Idaho ferryboats and the important part they played in the settlement and development of our beautiful state.

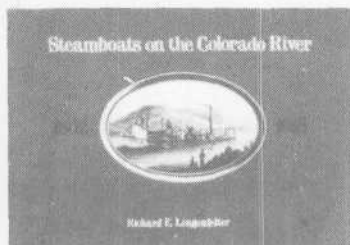


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lowed Smith by some five years and preceded General John C. Fremont and the Bidwell-Bartleson expeditions by some years also.

Wedertz has done a good job rounding up all the old tales about Aurora, Masonic, Bodie and the other East Slope mining bonanzas and brings his readers through the great snows and deadly slides of 1911.

He also presents vignette biographies of some of Mono's most distinguished early families. In paperback, 256 pages, with many previously unpublished historic photographs, \$9.95.



STEAMBOATS ON THE COLORADO RIVER, 1852-1916

By Richard E. Lingenfelter

There have been many books and articles written on the romantic if rugged history of steamboating on the Colorado River and its tributaries, particularly the Green, but Lingenfelter's lengthy effort, published by the University of Arizona Press, is the first to combine all the facets into one volume, and it's about time.

The first venture, appropriately, began at the mouth of the Colorado, with the launching of a little tug, the Uncle Sam, built to tow military supply barges up the river to Yuma. Her captain was James Turnbull, late of Benecia in the east San Francisco Bay. A sidewheeler of 20 horsepower, she proved inadequate

for the tough job of fighting the Colorado tidal bore and the swift river currents, but she made history.

Much of the Colorado steamer history was tied with two epochs of Southwestern history, Army campaigns and mining development, but in the later phases, during construction of the dam that would end the steamer era, the remaining lower river boats ended their careers as dormitories for dam workers. The last of these, the old Searchlight, remained active until 1916 as a levee tender for the old U.S. Reclamation Service.

In the 64 years between the beginning of the Uncle Sam and the sinking of the Searchlight, a number of private and government boats plied the main river as far up as the mouth of the Virgin River and smaller boats were built or hauled overland to work the upper Colorado and the Green for primarily mining ventures.

Perhaps the most famous upriver boat was the Charles Spencer, built by her namesake in the winter of 1911-1912 to haul coal for a foolhardy mining venture near Lee's Ferry. She was abandoned in the spring of 1912 after only two trips between the steam-operated mining mill at Lee's Ferry and the coal supply upstream at Warm Creek, now submerged by Lake Powell.

As the author points out, the steamers contributed to their own ultimate demise by hauling men and materials for the agents of their destruction, the railroads and the dams. A growing shortage of firewood doomed them, anyway!

Today, the only paddlewheelers plying the long desert watercourses are tourist craft, one running intermittently at Blythe and another nearly 1,000 miles upstream at Moab, Utah. Neither are steamers, incidentally.

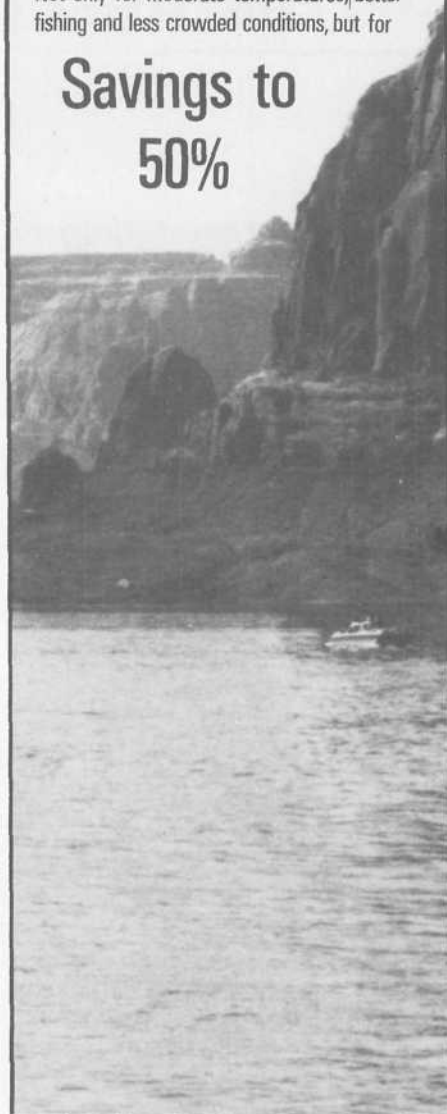
A prestige addition to your desert library, 195 pages, many maps, photos and historic sketches, paperback, \$9.50.

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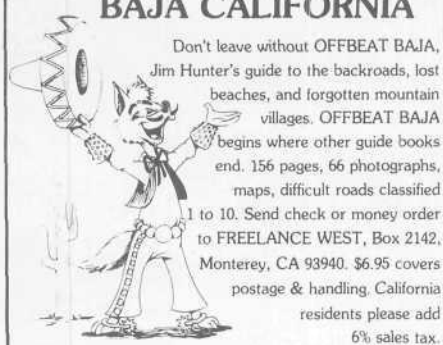
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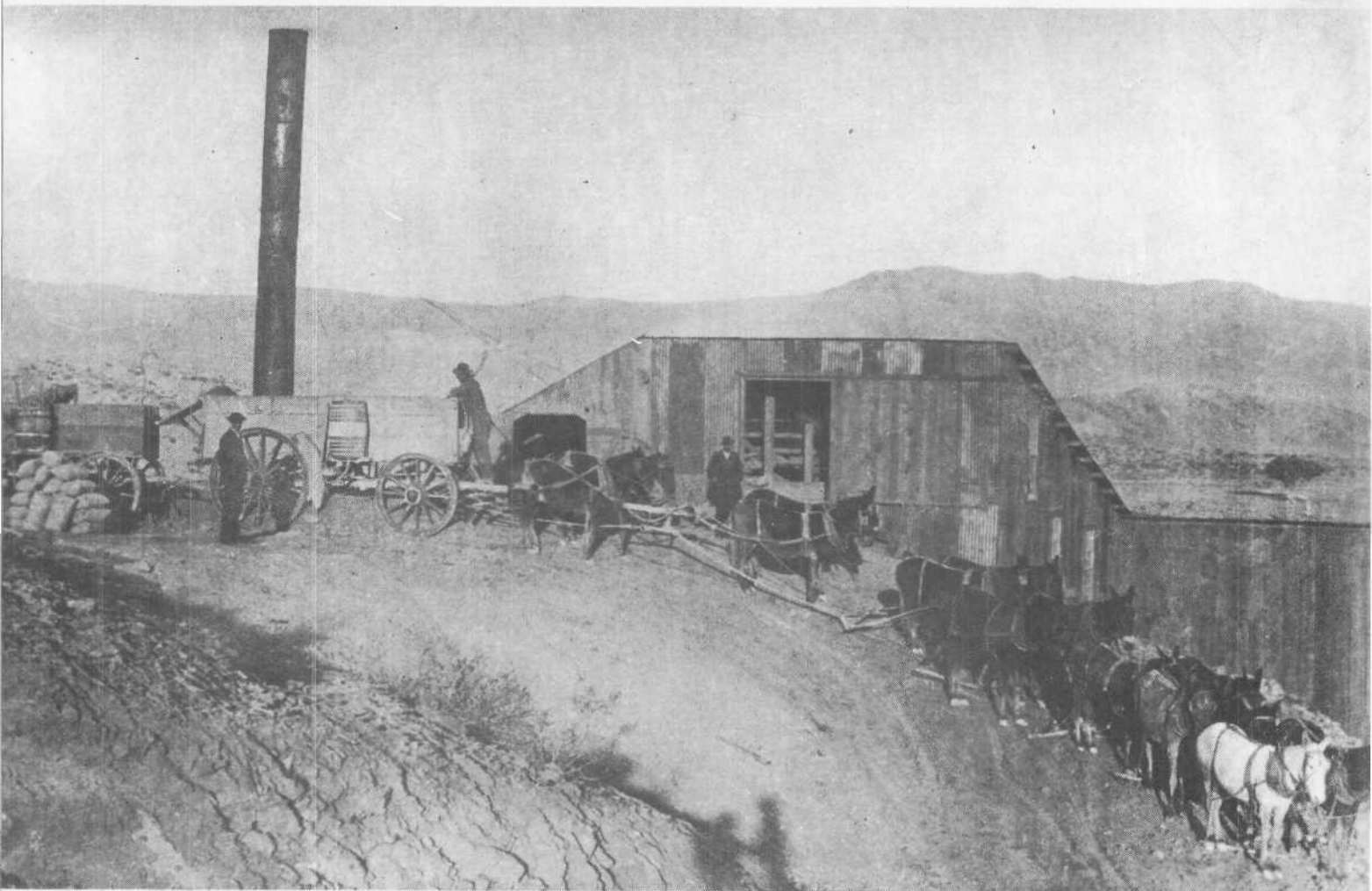
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**MANY A PROSPECTOR LOST A LEDGE OF
GOLD AND SPENT YEARS SEARCHING IN
VAIN. GEORGE LEE WAS DIFFERENT. HE
LOST TWO MINES! ONE BECAUSE HE OVER-
LOOKED THE VALUE OF HIS TAILING WASTE,
AND THE OTHER COST HIM HIS LIFE!**

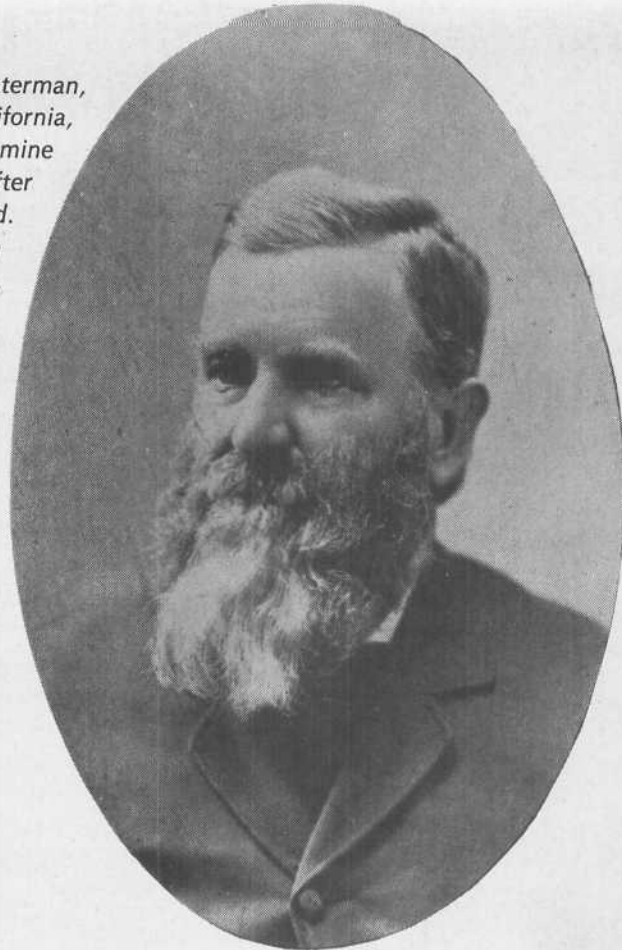
THE MINE LEE



Ore from the Waterman mine was hauled to this mill on the Mojave River at what was then Waterman and is now part of

Barstow. Ruins of mill may be seen today. 1880s photo from Burr Belden Collection, San Bernardino Westerners' Corral.

*Robert W. Waterman,
17th governor of California,
won a fortune from the mine
which he relocated after
George Lee disappeared.
That silver wealth enabled him
to enter politics.
Portrait from Burr Belden
Collection, San Bernardino
Westerners' Corral.*



REALLY LOST!

by HAROLD O. WEIGHT

GEORGE LEE was pretty well known in San Bernardino and around the Mojave Desert a century ago—but he had to disappear to become famous. George vanished in the Mojave in 1879, when he went out to work a ledge he had discovered there. He must have convinced many people that his ledge was bonanza-rich, from the number who went out to look for him—and it. They never found either. The Lost Lee hasn't been found yet.

George is principally remembered today for his lost ledge. But in the years immediately after his disappearance, his statewide fame was due to his other mine. The one that he lost, in a very real sense, because he failed to recognize what he had found. This mine he called the Pencil Lead, and it led to the discovery of the great silver mines of Calico, and almost as directly to making Robert W. Waterman Governor of California.

For George it did nothing.

Had he been an expert in ores, or had

adequate assays been made, George certainly would not have walked away from the riches of the Pencil Lead to die in the desert. There probably would be no Lost Lee today. Almost certainly there would have been no Governor Waterman. Calico, which Lee never lived to see, might have boomed in the 1870s instead of the 1880s. History is a tissue of chance and accident—and George seems to have suffered more than his share of both, alive and dead.

George Lee located the Pencil Lead mine in 1875, a few miles north of present Barstow, and about eight west of future Calico. Such maps as show it today identify it as the Waterman. What George filed upon was a narrow red vein which he believed was quicksilver. From at least 1875 into 1879, he developed the claim, doing more than the work necessary to hold it. He never doubted that the Pencil Lead would become a valuable mine.

During those years, the only 'spots of

civilization near George's claim were Grapevine and Fish Pond Stations, supply points on the San Bernardino-Salt Lake road. Both were on the Mojave River. Ellis Miller operated Grapevine, which would later become Waterman, and eventually part of Barstow. Lafayette Mechem was proprietor of the Fish Ponds, near present Daggett.

During part of the 1870s, two of Lafayette's sons—Charles and G. Frank Mechem lived with him at the station. In Brown & Boyd's *History of San Bernardino and Riverside Counties*, 1922, Charles Mechem recalled: "An old man by the name of Mr. Lee would come to our place often for provisions. We always kept enough on hand to accommodate travelers. Mr. Lee would work around San Bernardino, doing garden work, and after saving a little money he would go to his mine and prospect until his money was all gone and then he would return to San Bernardino and repeat the same thing over again. He

would bring some of his ore with him every time he came for provisions."

George Lee invited the Mechams to come over and see his mine. Brother Frank did. He found Lee in the shallow shaft, filling buckets with the rock he had blasted out. Heber Lytle, whom Lee had hired to help, was at the surface, hoisting and dumping the buckets. In following and opening his prized red vein, George broke out and threw on his waste dump quantities of a waxy ledge material that was soft enough to cut with a knife. This was the "pencil lead" for which he named his claim.

Years later, Frank Mecham would remember vividly how, between buckets, Lytle sat there whittling aimlessly at a piece of this soft and sectile "waste" rock. Frank remembered it so well that after its value was recognized, he was one of the prospectors who discovered the same ore at Calico and located the great Silver King mine there. That dump rock proved to be cerargyrite or horn silver—a rich chloride of silver. Assays of it would run to \$3000 a ton.

George Lee's "quicksilver" was only one of his prospective bonanzas. Five years after he filed on the Pencil Lead, he headed east to work on another, supposed to be extremely rich.

April 6, 1880, the San Bernardino *Daily Times* carried a story headlined: "A DESERT TRAGEDY—Geo. J. Lee Killed by Chimehuevas."

"On a prospecting trip to the north-east of San Bernardino about 100 miles, from which Barney Carter and C. J. Reed have just returned, they discovered the spot where George J. Lee, well known in San Bernardino as a veteran prospector, met a violent and sudden death at the hands of a party of Chimehueva Indians. Mr. Lee left San Bernardino last summer to explore this unknown country, and months elapsing without his return, a search was made for him.

"A peculiarity of the soil there retains any imprint on its surface for ages, and the old man's tracks were discovered and traced for days, but nothing definite was found. On their last trip Messrs. McIntosh and Carter followed his footprints to the spot where he was killed. Some bloody clothing lay on the ground, and an examination showed that Mr. Lee had been walking leisurely along when a party of Indians in ambush behind some bushes fired upon him. He reeled and sank, digging his elbows into the soft earth; the Indians then revealed themselves, and placing his body on a horse carried it off into the mountains . . ."

Quite an impressive and detailed account, particularly since the men, who were prospecting in the Dry Lake District, found no body and saw no Indians. About a month later another party, prospecting the same district north and east of Old Woman Springs, spent a day

searching for Lee's body, unsuccessfully.

The only evidence—if you want to call it that—directly connecting Indians with George's death surfaced about a year later at Ivanpah mining camp. Dan Kiestler, a cattleman, was shot to death there by an Indian named Win, tribal affiliation not noted. The San Bernardino *Valley Index*, April 1, 1881, said: "The murderer being an Indian, the county was relieved of the enormous expense of a murder trial. A few citizens took the matter into their own hands and made short work of the matter."

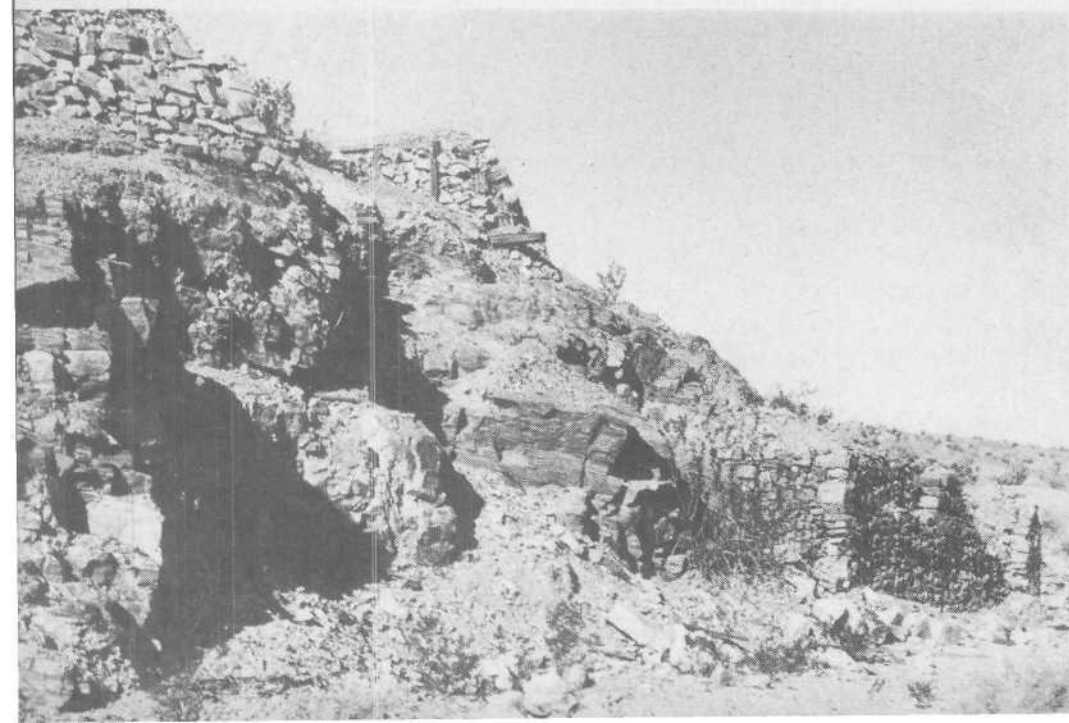
Then the writer added, almost as an afterthought, "Win confessed to having killed Lee, who disappeared upon the desert."

A solution of the Lee mystery should have received greater prominence than that, since George and his Pencil Lead were dramatically entering the news picture at this time, thanks to Robert W. Waterman. In the 1870s, Waterman was a prominent citizen of San Bernardino. He owned a "beautiful semi-tropical ranch"—the western part of present Arrowhead Hot Springs. He also was a beekeeper, and operated the Holstein Dairy, largest in the valley. He represented the Hot Springs on the executive committee of the Agricultural Society. He sold farm implements.

The late L. Burr Belden, who gathered and published an incredible amount of San Bernardino history and legend, said that Waterman became interested in mining when he saw a wagonload of Ivanpah silver bullion displayed at the bank where he was depositing his meager dairy earnings. In the fall of 1880—September, Belden said—Waterman and John L. Porter, his partner, camped at Grapevine Station on a prospecting tour. When he inquired about local mineral possibilities someone mentioned Lee's "quicksilver" claim—apparently untouched since George's disappearance. Station keeper Ellis Miller later swore in court he had told Waterman, with the understanding he would receive a half interest should the claim prove valuable.

One story is that when Waterman and Porter visited the claim Porter, an experienced practical miner, instantly recognized the horn silver, and claims were filed. The other—more likely since the claims were not filed until December 7, 8, and 9—is that Waterman and Por-

Dry stone walls of the Waterman mill, looking like primitive battlements, can still be seen in north Barstow. The mill processed more than a million dollars in silver.



ter were disappointed and made no locations. They did take samples, however, and when spectacular assay values were returned, they rushed back and staked out ten claims.

Immediately when the mine's richness became known, the legal struggle for it began. Ellis Miller's claim to a half interest was rejected by a jury in September, 1881. But the real battle for the mine—between Waterman and Lee's relatives—would continue through two years of bizarre and grotesque happenings.

Someone located Lee's mother, brothers and sisters in New York state and informed them of George's disappearance and of the rich claim he had held. Brother Robert Lee came—or was brought—to San Bernardino to represent the family. Waterman seems to have been a stubborn man, not adverse to legal contention, and one whose business ethics were called into question more than once. He refused the Lees any compromise or concession.

December 21, 1881, Dr. A. F. White, acting for the Lee relatives and alleging that George Lee had died in August, 1879, applied for letters of administration for his estate. Ten days later, Dr. H. W. Rice, San Bernardino County Coroner and Public Administrator, filed a contest to White's application, claiming that he had the better legal right to administer. Since Dr. Rice was Waterman's son-in-law, there were immediate cries of outrage. But if Waterman did influence Rice to act, he had reason: The Waterman mine was listed as part of the Lee estate White was to administer.

If George Lee was not dead, there was no estate to administer. If he was and the relatives had no will designating them as heirs—which must have been the case for Rice to intervene—they had no right to administer. Recognizing the probability that Rice would come out of the contest as administrator, White withdrew his application. Almost immediately, however, on January 7, 1882, the Lee relatives and White (now claiming an interest in common with the Lees) sued Waterman and Porter, alleging George's ownership of the Pencil Lead, his death, and their title as successors. They demanded recovery and possession of the mine, and \$50,000 damages.

Providing George could be ruled dead, the claimants must still prove he had



George Lee's "Pencil Lead" claim became the Waterman mine, which produced more than a million and a half in silver. Mine in operation in the 1880s, with team hauling ore to the mill on the Mojave River. Burr Belden Collection, San Bernardino Westerners' Corral.

completed the annual labor for 1879 necessary to hold the mine. If he did he then would have had the whole year of 1880 to do that year's assessment work. The Pencil Lead would have been protected from relocation until January 1, 1881. Waterman and Porter, filing over Lee's claims in early December, 1880, would have been claim jumpers. But before that could be considered, George must be declared dead.

A body was needed. In light of later events, it might seem an effort was commenced to supply one. While the case was being tried, a San Bernardino *Index* headline for February 11, 1882 read:

"LEE'S BODY FOUND"

"There is a rumor, and it comes very straight, that the body of old man Lee, who was lost on the desert some few years ago, has now been found. Parties are now on the road after the body. Some men on the desert found the body and sent word to some of the old man's relatives that they had found it and it could be identified beyond all doubt . . ."

Apparently the parties found no body, or it was not Lee's. On April 11, 1882, after being out 15 minutes, the jury in San Bernardino Superior Court found in favor of Waterman.

The Lee relatives and Dr. White immediately moved for a new trial, and when that was refused, appealed to the

California State Supreme Court.

George Lee dead was now more important than he had ever been alive. At the end of July, 1883—the Supreme Court not yet having acted on the Lee-Waterman case—a body finally was forthcoming. A. L. Hoffman, a mining man "somewhat eccentric and addicted to drink," declared he knew George had been killed, on the Mojave in 1880, about five miles from Calico. Later, drunk, he is said to have admitted doing the killing.

Five miles from Calico could be very close to the Pencil Lead claim. But when Hoffman went out to the desert with officials, he led them to Old Woman Springs (40 air-miles from Calico). There a body was exhumed and brought to San Bernardino, in a couple of metal cracker boxes.

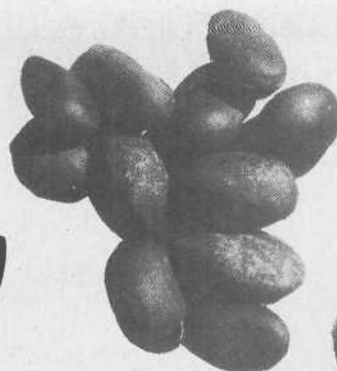
Reporting the story August 2, 1883, the *Los Angeles Times* commented: "The hypothesis that (the remains) are Lee's looks extremely improbable. It must be remembered that there is a bitter contest over the mine between Lee's heirs and Waterman and Porter, present owners of the mine, and in the past no expense has been spared on either side, and the case is still pending in the courts. If it can be proved that Lee was murdered on the desert near the famous

Continued on Page 38

Pinyon Strategy

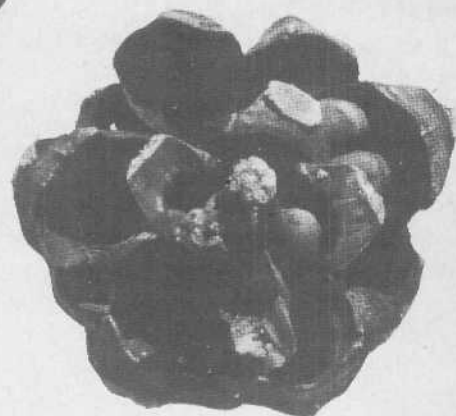
by K. L. BOYNTON

© 1979



Pine nuts [left] and cone [below] with a few nuts still in place.

Photo by Harold O. Weight.



I N SOME FALL, a pinyon-juniper woodland is a mighty busy place. Day and night, at that. Then it is that the pinyon nuts are ready and many an interested furred and feathered citizen around and about knows it. The jays are in the trees stuffing themselves in the bright sunlight and quarreling with the chipmunks who are likewise stuffing themselves and quarreling with the jays.

When the woodland darkens down, packrats are busy; big eared deer mice and harvest mice, climbing the branches, sniff out the cones with the best and biggest nuts, other members of the mouse tribe pattering about on the ground below find those that have fallen. Sunup, the woodland resounds once more to the clamor of the loudmouthed jays and scolding chipmunks back for breakfast.

On the face of it, it would seem that the pinyon tree is running a free grub stand, but let it be reported here that this is by no means so. The provender spread out so lavishly is part of the slick strategy this sturdy little tree has evolved for dispersing its seeds.

If a tree species is to continue to flourish in an area and to widen its distribution, it has to have some way of distributing its seeds. Many pine trees, such as the ponderosa, handle this situation by producing small, light seeds equipped with "wings" which sail away on the wind. This method is not very efficient, for when the little seeds are blown about so willy nilly, many land on bare rocks or in water or places so unfavorable for growth it may take years for the seedlings to get underway.

The pinyon produces seeds that are too heavy to be dispersed by the wind. Wingless, they may be up to one-half

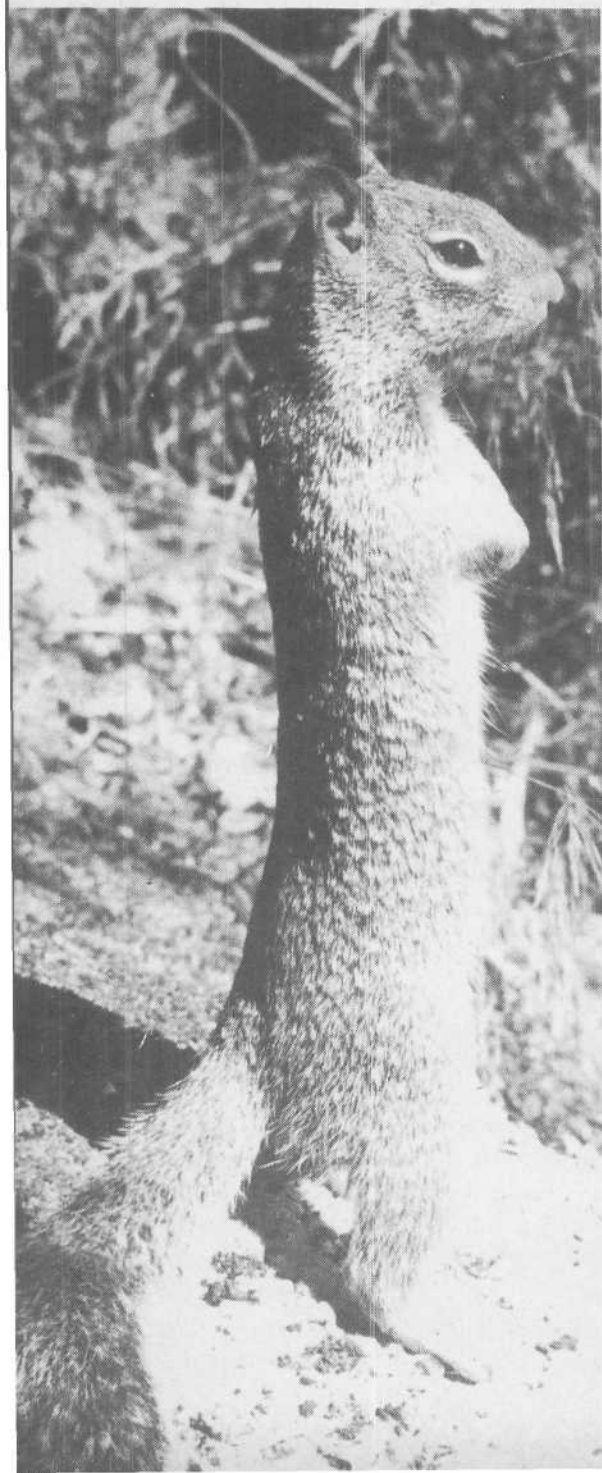
inch long. If they simply dropped to the ground below, there would be only isolated groves of pinyons in restricted areas. Even under the best of soil and moisture conditions the seedlings would be stifled by crowding and competition from the mature trees. In the arid Southwest, the loss would be astronomical for the seedlings could even less stand the competition under stress of high temperature and lack of water.

In solving its heavy seed dispersal problem, the pinyon neatly employs the services of the mobile citizens of the region, particularly those who store their extra groceries in shallow caches in the ground. These food harvesters do the dispersal job for the tree, for many of the seeds they bury will never be retrieved. In time, many of these germinate and the new seedlings thus carefully "planted" are off to a fine start for carrying on the pinyon line. Often, too, the seeds are carried away to brand new areas, and thus pinyon trees become established in places where they have not been before.

So successful is this seed dispersal system that pinyon pines, together with various species of junipers, make up a distinct type of woodland that covers an area in western United States variously estimated to be between 60 and 100 million acres. Its range extends throughout the southern Rocky Mountains and mountains of the Great Basin from southern Idaho and Wyoming through the eastern edge of northern California, Nevada, Utah and western Colorado into the high plateau region of Arizona and New Mexico.

Growing at altitudes from 3000 feet or so in the north to 8500 in its southern ranges, the pinyon juniper type of wood-

Rock ground squirrel loves pinyon nuts. Photo courtesy Jim Cornett, Palm Springs Desert Museum.



land lies just below the ponderosa pine zone and is the first conifer belt up mountain from the sagebrush desert. It is a belt where rainfall may run only 10 to 25 inches a year, with daily and seasonal temperature extremes, high wind movement and an evaporation rate by far the highest recorded for any forest type. In fact, Botanist L. Benson, noting the small number of woody plants supposed to differentiate the juniper-pinyon woodland from the sagebrush desert, suggests that maybe the two are not really so well segregated as previously thought. The hardy little old pinyon makes it anyhow in this desert-like environment, even securing toeholds on steep talus slopes of mesas and rocky canyon walls. One of the most drought-resistant of trees, it needs only 12 to 18 inches of rain annually, its shallow roots making the most of what's delivered. Growth is slow, trees 150 to 375 years old reaching a breast-high diameter of 12 to 30 inches respectively. A scraggy tree at best, the pinyon is not a candidate for any botanical beauty contest, but its system of getting its seeds hauled off by cargo carriers and planted is a winner.

Now a bird or animal doing his daily grocerying is out to get the most and best food with the least cost in time and energy. The diner wants fast service in the food line, particularly when being jostled by pushy competitors out for the same food and since he is usually on the dodge himself to escape predators who wish to eat *him*. Furthermore, if the diner is the prudent type who believes in laying in a good store for future use as do the various jays, Clark's Nutcracker and the pantry stockers among rodents, the food has to be worth the hard work of collecting, hauling and burying it.

To attract these energetic members of the Seed Burying Society, the pinyon offers a first class product and backs it up with a marketing program that really delivers the goods.

It hasn't been an easy job.

The pinyon, it seems, belongs to a group of primitive plants living today (the cycads, ginkos, Mormon Tea, pines and many other kinds of conifers) called *Gymnosperms* (Greek for "naked seeds") because they never got around to evolving flower structures in which their developing seeds could be enclosed and fully protected. In line with its old conifer family tradition, then, the pinyon



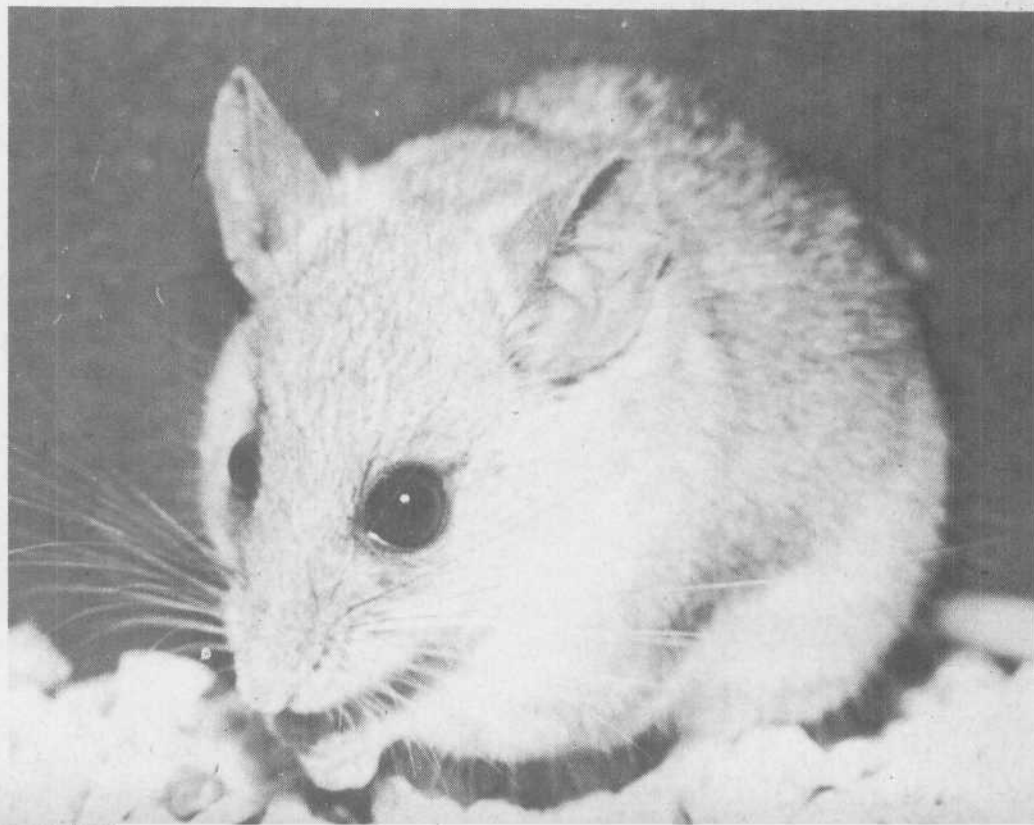
Pinyon pines in Joshua Tree National Monument. Photo by Harold O. Weight.

pine has no flowers but produces cones instead, formed of scales spirally arranged on an axis.

Each tree produces separate male and female cones. Male cones are smaller and grow in groups. They are the red

clusters that seem to cover the two needle pinyon in the spring. Sacks develop on each of their diminutive scales and it is here that millions of grains of pollen containing the male cells are manufactured. The young female cones grow

White-footed mouse won't pass up pinyon nuts. Photo by Jim Cornett, Palms Springs Desert Museum.



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singly. They are larger, short stalked and rather purplish in hue and it is on their scales that "ovules" develop in which the seed-to-be will eventually take form.

At the right time the pollen sacks of the male cones burst open and the pollen is released into the air. It sifts down upon the female cones and fertilization begins, to be completed only after many complex changes take place. An embryo forms and seed development is at last underway.

Producing these seeds costs the tree considerable energy. It also takes a long time, Botanist E. L. Little finding that it actually begins in August when the first winter buds that will become new cones start to form. The buds are fully mature by October but growth stops and does not resume until May of next spring. Pollination occurs in June and cone growth continues only to stop once more in August. The following May it picks up again, and finally in September the cones are mature and nutlike seeds at last ready. The cones open and the tree is ready for customers.

Besides being big and hence attractive to harvesters interested in filling themselves up fast and increasing their foraging rate, the pinyon seed is stuffed with food value. Little's careful analysis showed that each seed has an energy value of 7.409 kilocalories per gram, high in comparison to seeds of other pines. If stored and retrieved during the winter when free food is almost unavailable, its value increases still more. Here again size is important, making collecting trips pay off in quickly gathered caches for those customers winging in from a distance.

Now a thick hull on a seed means it has to be worked and worked on before the diner can get to the good part. It takes time and effort. This discourages harvesters and consequently adversely affects seed dispersal. Testing the seeds of six kinds of pines including two which produce big seeds, Biologists S. B. Vanderwall and R. P. Balda, during the course of their big pinyon-Nutcracker study, found a definite relationship between size and coat thickness: trees that produce big seeds provide thick hulls for them. Not the pinyon. Its seed coat is thin, which further increases the seed's chances for attracting harvesters and hence being dispersed.

Not all seeds are sound. Some fall victim to insect pests, some due to environmental stress do not mature properly. For the tree it is most important that only seeds that will grow are distributed to sites favorable to germination. For the seed customer, only those that are edible are worth hauling off and caching.

How do they tell the good ones from the bad?

There's color for one cue, perhaps a built-in dispersal adaptation by the tree. Good seeds are dark brown, the inedible, tan, and experienced jays and nutcrackers, cocking a knowing eye, use this. The good ones weight more, too, a bill pick-up test showing this. There may be a sound difference, too, birds often clacking seeds in their bills reject certain ones. Certainly there is an odor difference clear to bewhiskered rodent noses, and a weight difference easily tested. All these cues make shopping for good pinyon seeds easier, speed up harvesting efficiency and increase dispersal chances.

Packaging always counts, and the pinyon displays its merchandise right, quite different from pines using the wind for seed dispersal. The cones of these other pines point downwards and outwards, and while this makes it easy for the seeds to fall out and be on their way, it is hard for foragers to see them and get at them under the down-slanting scales. Pinyon cones face upwards and outwards. Not only does this keep the seeds from falling out, it also shows them off better. The light gets in around the open scales. Vanderwall and Balda observing the cones from all angles found that indeed some 87 percent of the seeds are visible from the cone's apex, 77 percent from the sides.

Pinyon cone design is also excellent. There are only 25 scales to a cone (the ponderosa has 73) which means fewer to be searched. They are short, too, and do not hide the seeds, and they have no spines as do some pine cones to get in the way of seed removal. Fanciest of all is that ingenious pinyon super touch: each seed rests in a deep depression on the scale held there by small flanges attached to the inner surface of the cone sides. Hence the merchandise is kept as long as possible for those customers such as jays who do much of their shopping in open cones by day and for the climbing members of the mouse tribe

who work the tree by night.

What with holding the merchandise on the shelves as long as possible and its schedule of cone opening from early September to late October, the pinyon makes at least 50 days of harvesting possible. The gun jumpers among customers who work the ones just before they open make the season that much longer.

Biologist J. D. Ligon, long interested in the pinyon tree-pinyon jay relationship, noted that widespread heavy crops were produced over much of the Southwest at irregular and infrequent intervals: 1936, 1943, 1945, 1954, 1959, 1965, 1969, 1974 and he wondered. True enough it takes three growing seasons to turn out a cone and a lot of climatic and moisture variations can take place in that time which would account for crop differences, but only in part. There had to be something else.

He thinks that the pattern of synchronous production of seeds over such a large geographic area evolved as a defense response to seed predators. Pine cone moths, pine cone beetles and other insects kill cones and growing seeds. In years of poor seed crops or none at all, big populations of these insects die off. Come a bumper seed crop, there are fewer insects around to do damage. Furthermore millions of seeds maturing simultaneously stuff the feathered and furred eaters full, leaving millions to be stored. As Biologist D. H. Janzen points out, seeds that are eaten by these pantry-stockers is the price the tree pays for reliable dispersal and planting. With a bumper crop, the proportionate cost is low.

Naturally any tree with an off-beat production schedule is at a big disadvantage. Local and out-of-area predators descend upon it and promptly eat up most if indeed not all the seeds, leaving the tree with a minus score reproduction-wise. This is particularly the case with pinyon jays who are forced to wander great distances for provender if crops in their home range fail. When some 300 of these hungry transients come winging in, local pockets of out-of-phase pinyons are cleaned out in no time.

This synchronous timing of seed production over widespread areas of its range is an ace in pinyon dispersal strategy that has only recently come to light. That this tough, scraggy little tree has still others, is worth betting on. ☐



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NEVADA'S VALLEY OF FIRE

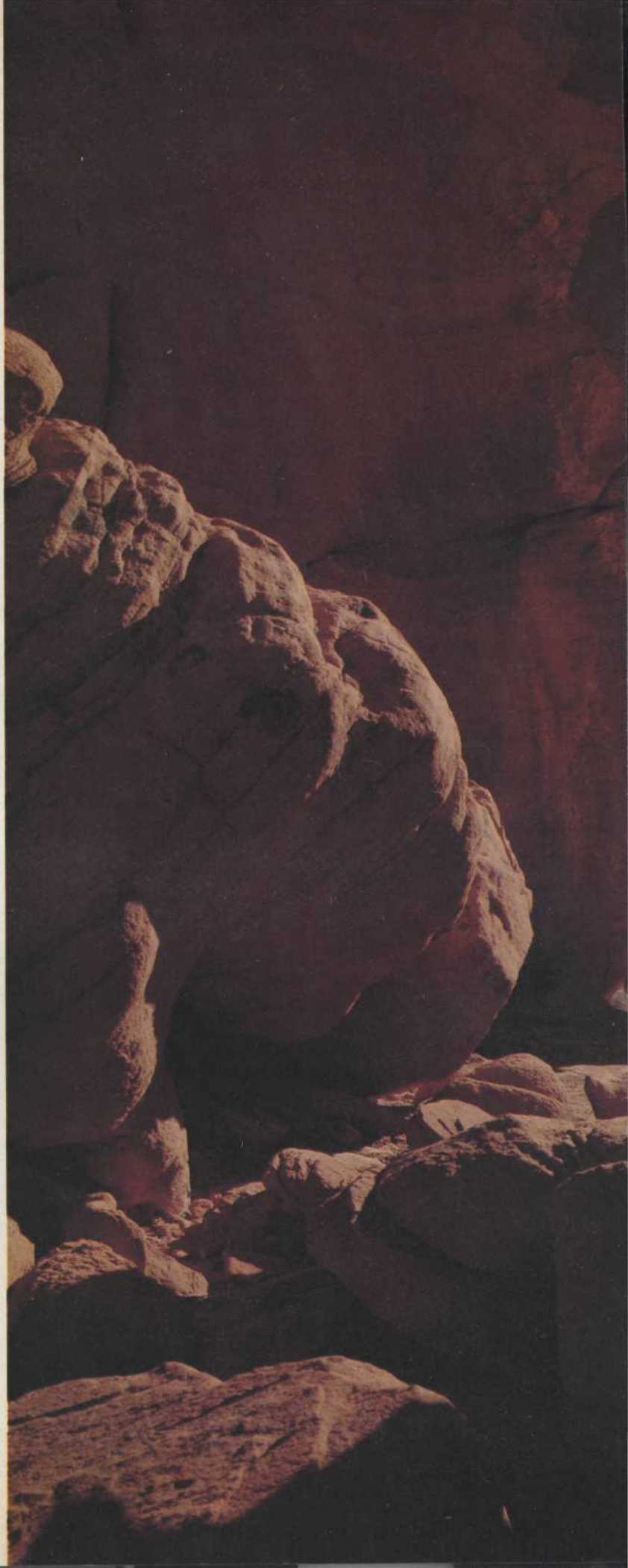
by HELEN WALKER

IF YOU are traveling between Las Vegas and Salt Lake City, on Interstate 15, Nevada has a surprise for you—the Valley of Fire. You cannot see Valley of Fire from the highway, but you can reach it by driving just 18 easy miles east on N40, about 55 miles north of Las Vegas. The valley is obscured behind a low profile ridge, where not a hint of the surprise is given away.

As you top out on the ridge, and look down into the valley below, only one word can describe what lies before you—“spectacular.” I can tell you how red and golden the bluffs contrast the blue sky and the surrounding Muddy Hills, but you must actually see it, to believe it.

Right where you will want to stop to take in the view, Nevada has provided a view/rest stop—drive in and take advantage of its orientation. A large contour map marks the point where you are, what you are about to see, where you may camp or picnic, and where the Visitor Center is located. It does, in fact, prepare you for your visit down into the valley, whether it be for a few hours or a few days.

As you travel, give thought to the past, and the 600 million years of geology that were required to create what you are about to see. Visualize that where you travel now, there was once a sea, hundreds of feet deep, and its shores reached to the distant horizons. It was a





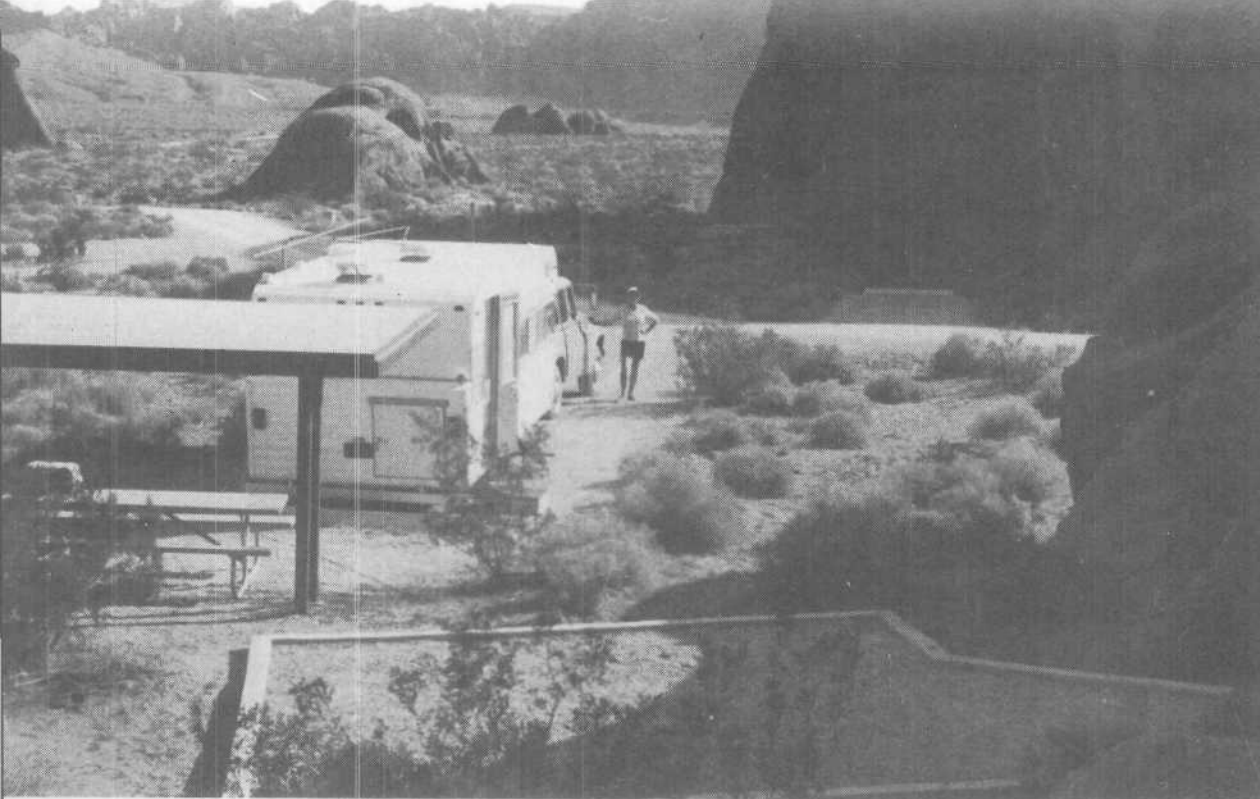
*Sandstone forms
in the Valley of Fire.
Photo by David Muench.*

warm sea, and during the 300 million years of its existence, marine and plant life flourished, allowing time for simple life forms to grow in their complexity. As new life replaced the old, beds of lime deposits and shells blanketed the sea floor—building layers hundreds of feet deep.

As time traveled up the geological time scale, the sea floor gradually rose, lifted in part by forces beneath its crust. Slowly the seas disappeared, leaving behind mud flats and sluggish streams. During periods of heavy rainfall at the higher elevations, the streams became swollen, and coarse sand, branches, twigs and tree trunks were washed down and became imbedded in the mud flats. For 75 million years, the limestone beds continued to be covered with the highland run-off, growing to a depth of nearly 5000 feet.

Climatic conditions brought another change to this area. Searing heat and dry swirling winds dried the mud flats and piled the sand into lofty dunes. The dunes became embedded and crossbedded with the muds and limestones and thus we see the creation of abstract mounds throughout the valley. Nature shaped them into whimsical and grotesque shapes. The given name of this material in the dunes is Aztec Sandstone. It is practically fossil free, as a result of the oxygenated environment that causes a rapid decomposition of flora and fauna. The brilliant colors that predominate in the valley are deep reds and near purples, to the more subtle tans and whites. The changes in color are due to groundwater that percolated through the sand and leached out the oxidized iron.

You may want to get settled into camp before setting out to explore the sights. Valley of Fire is a State Park. In fact, it is Nevada's oldest State Park, dedicated in 1935. There are two campgrounds, with 50 units each—watch for the turn-off signs as you reach the valley floor. You will find a variety of sites—long, level pads for trailers and campers; a bit more private spots for tents, etc. Each site is provided with shade, a picnic table, BBQ, water nearby and restrooms. There is also a dump station at one



*Campground,
Valley of Fire.*

campground. A fee is charged, and is payable at camp.

Whether you plan to camp for a few days or just stay for a picnic, a stop at the Visitor Center will be well spent. Here you will be provided with a free brochure covering the facts about the valley, and a

map which will guide you on a tour of the sights of interest. All the listed sites are reached by auto, a few require short walks, and some easy hikes are optional. Most of the sites have water, picnic areas, restrooms and ample parking space.

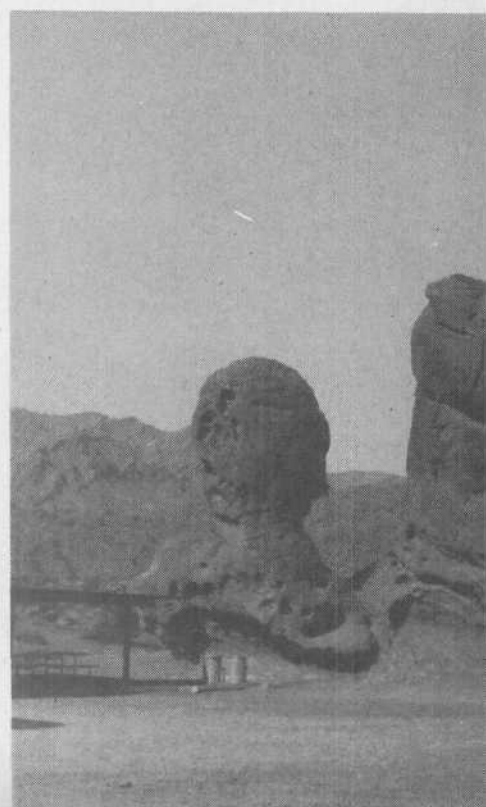
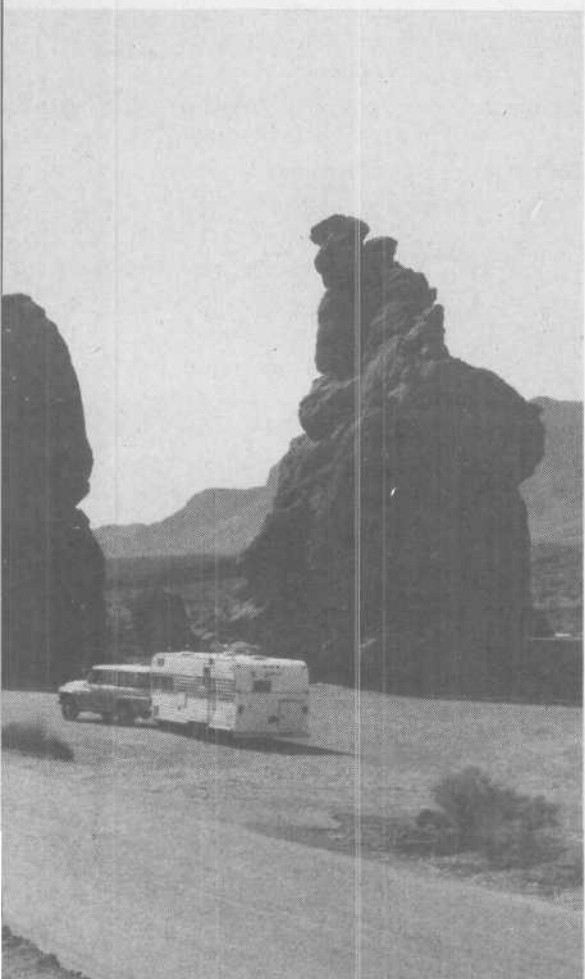
During your tour of the valley, take a close look at the sandstone dunes—rub your hand across their abrasive exterior. These dunes are of the Mesozoic Era on the geological time table, some two million years old. You will notice that some dunes are delicately crossbedded, the others show deep, etched wrinkles. The cementation of the sandstone particles occurred under a variety of circumstances and climatic conditions—therefore some areas of the dunes are of harder material than others. In periods of torrential rainfall, the softer material is washed away, while the harder substances resist wind and chemical destruction. The harder sandstone forms knobs, and they are referred to as “Indian Marbles.” As the softer material is washed away, it leaves picturesque arches, holes and hollow spots—a delightful playground for children, and a real challenge for photographers.

Another surface to look for is the smoother and usually darkened veneer. This slicker surface is a result of ground water seeping through the joints in the

sandstone. The softer material became leached out and a harder material replaced the voided space. This material was usually quartz or calcite. Eventually, the cleavage between the soft and hardened surface breaks away, leaving the slick, smooth surface.

Some of the surfaces of these vertical joints are streaked with white mineral deposits, while others are coated with a dark finish known as “desert varnish.”

Look carefully on the harder dark surfaces, as it was here that the early Indian



Picnic areas are chosen for their view.

residents of the valley carved and pecked their art that we recognize today as petroglyphs. Two of the best displays of petroglyphs in the valley are at Atlatl Rock and Petroglyph Canyon. The atlatl that is plainly pecked on the smooth joint face of Atlatl Rock dates back some 3000 years. The atlatl was a notched stick used by the Indians to increase the distance and accuracy of the spear he was using as a hunting weapon. This combination of weapons was a predecessor to the bow and arrow.

Other rock art at these and similar locations throughout the valley date back to 500 AD to 1000 AD, and are believed to be the work of the Pueblos.

There are several excellent displays of petrified logs along the self-guided tour. These logs were washed down from the highlands when the seas had dried to mud flats. They became buried in the mud and slowly their woody materials were altered, molecule by molecule, and replaced by quartz and other minerals. Some of the petrified logs have become fractured by earth movements, some have changed colors where exposure has oxidized the minerals.

Plant life and the animal population of the valley have endured the struggle for survival. You will find the familiar creosote bush, brittlebush, Mormon Tea and a variety of cacti. In the early spring, nature produces a blanket of brilliant wildflowers. Each individual specie has de-

veloped its method of resistance to harsh weather.

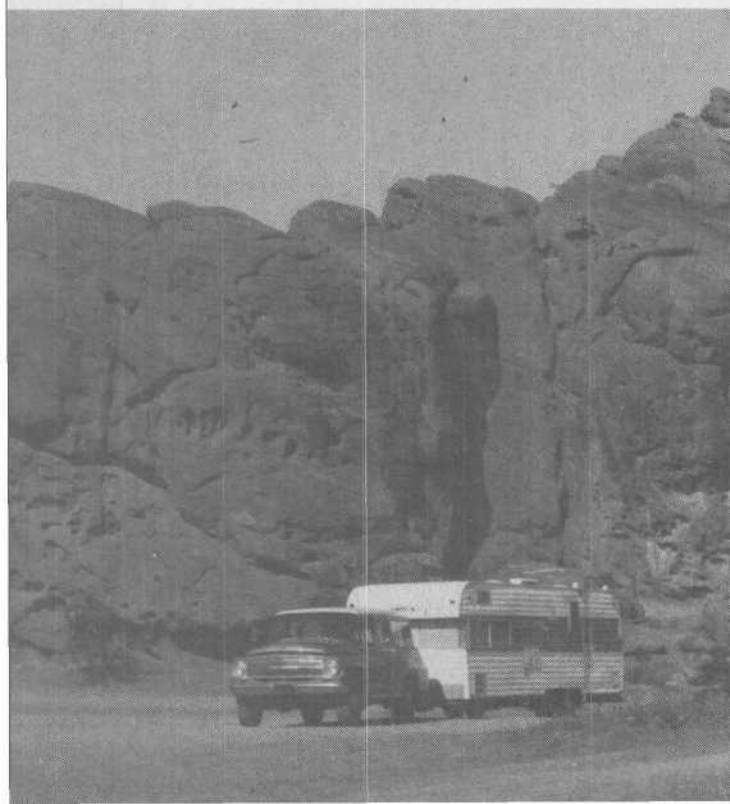
Animal life has an advantage over plant life. The animals can move underground to avoid heat, and become nocturnal when necessary to survive. If you are an early riser, take a quiet walk and you will see the tracks of the pack rat in the sand, small indentations of the kangaroo rat and long, swirling trails of the lizard or snake. This is the story of life after dark, the hunt for food and search for water.

Early inhabitants of the valley have left behind many of their relics. Most of these can be enjoyed at the Visitor Center. There are baskets which were used to carry seeds and water from the higher elevations, grinding tools and the weapons with which they provided their families with fresh meat.

Another excellent place to view Indian relics and learn more facts about the valley is at the Lost City Museum at Overton, just a few miles northeast of the park on the eastern entrance.

You can visit Valley of Fire anytime, but the ideal visit is made in the early spring or during the fall months. Summer sees the thermometer rise to above 100 degrees, and winter months bring freezing temperatures.

Whenever the visit, you'll find it is one "surprise" that will linger in your memory, and hopefully in the photos you take home. □



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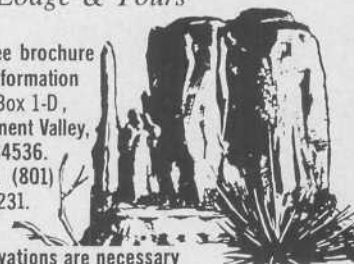


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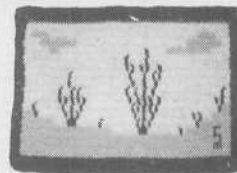
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Imperial Valley's Historic Mexican Fort

by HERMAN W. RONNENBERG

ON APRIL 23, 1826, a Kumeyaay Indian, a captive taken in a small, brief war, was publicly shot at the military presidio of San Diego. Twenty pairs of ears from his fellow warriors had already been put on public display. The Mexicans did not shoot this now-nameless man to celebrate their victory, but to try to take the sting from their defeat. The fierce warriors of the burning Colorado desert, the inland area the Mexicans described as being *muerto* (dead) or belonging to *diablo* (the devil), had pushed out the intruders. The fort the Mexicans had built at the place called Laguna de Chapala had ended its history after only four months and was never to be regarrisoned.

In the 153 years since then all visible signs of the fort have disappeared, but the site, near Imperial, California, is now being excavated and hopefully will one day be restored.

Most of the history of the fort was researched by volunteers from the Imperial Valley College Museum and published in its Miscellaneous Publication number six as preparation for archaeological work at the site.

The history of the fort had been essentially lost before their research began. About the only Imperial County resident with a prior interest in the fort was ex-sheriff Hubert Hughes, who is a published poet and local historian. He photographed and measured the decayed, but still visible, walls in 1958.

In 1973, he contacted the then recently established museum to share his information. Chief Museum Curator Michael Barker and Museum Director William Farris were immediately interested and the project has been underway ever since.

Just how did a Mexican fort come to be established in a part of California the Mexicans, and before that the Spanish, tried so hard to avoid entering?

The Mission San Diego de Alcalá was founded on July 16, 1769 and its impact immediately extended to the hot lands beyond the coastal mountains; the area we know as the Colorado Desert, which today includes Imperial and the southern portion of Riverside counties.

Five years later, in 1774, the "Conqueror of the Desert," Juan Bautista de Anza, made his famous crossing of the area. On the portion of his journey from "Cerro Centinela" (Mt. Signal) to "San

*Opposite page:
Test trenches at the
fort site. Such a test
trench may uncover the
remains of one of
the cavalry men not
listed as being buried
back in San Diego.
Right: Bull Head
Slough, lying about
100 yards west of
the site. Today it
carries a great deal
of irrigation run-off.
In 1826, it was
probably just a
wet place.*



Sebastian" (Harper's Well) he must have passed close to the future fort site.

In 1784, Pedro Fages, another noted Spanish explorer of California, also passed through the vicinity.

In 1821, political upheaval ended "New Spain," and in 1824, the Federal Republic of Mexico was born. The as-yet-unconceived-of Mexican fort thus avoided going down in history as the "Spanish Fort."

The following year, Lieutenant (sometimes referred to as Captain) Don Santiago Arguello from Presidio San Diego was chasing deserters when he discovered a new and better land route through the mountains to the eastern desert. The usual route was the one Anza had pioneered through Coyote Canyon (now a popular hiking area in Anza-Borrego Park). Coyote Canyon forms a natural wedge between the Santa Rosa and the San Ysidro Mountains — a natural east-west corridor. Arguello's route crossed San Felipe Valley from Carrizo Wash to the Warner's Hot Springs area and then to the coast. The routes are essentially parallel but Arguello's is more southerly, hence closer to San Diego.

In 1823-24, another Spanish (actually Mexican) explorer, Captain Romero, developed a trail from Alta Pimeria (Tucson) to Pueblo Los Angeles by way of the Yuma Crossing of the Colorado River and the San Gorgonio Pass (present day Beaumont, Banning and Cabazon). This "San Gorgonio-Cocomaricopa" route had to be made safe from Indians, so the Mexican government ordered Lieutenant Romualdo Pacheco to build a fort at San Gorgonio (Banning). Pacheco personally preferred the Carrizo route of Arguello so he delayed and bided his time at San Diego.

The first Mexican Constitutional Governor of Alta California, Senor Jose Maria Echeandria, arrived at San Diego in November, 1825. Being the largest settlement in Alta California (1,829 non-Indians), San Diego became the seat for his administration.

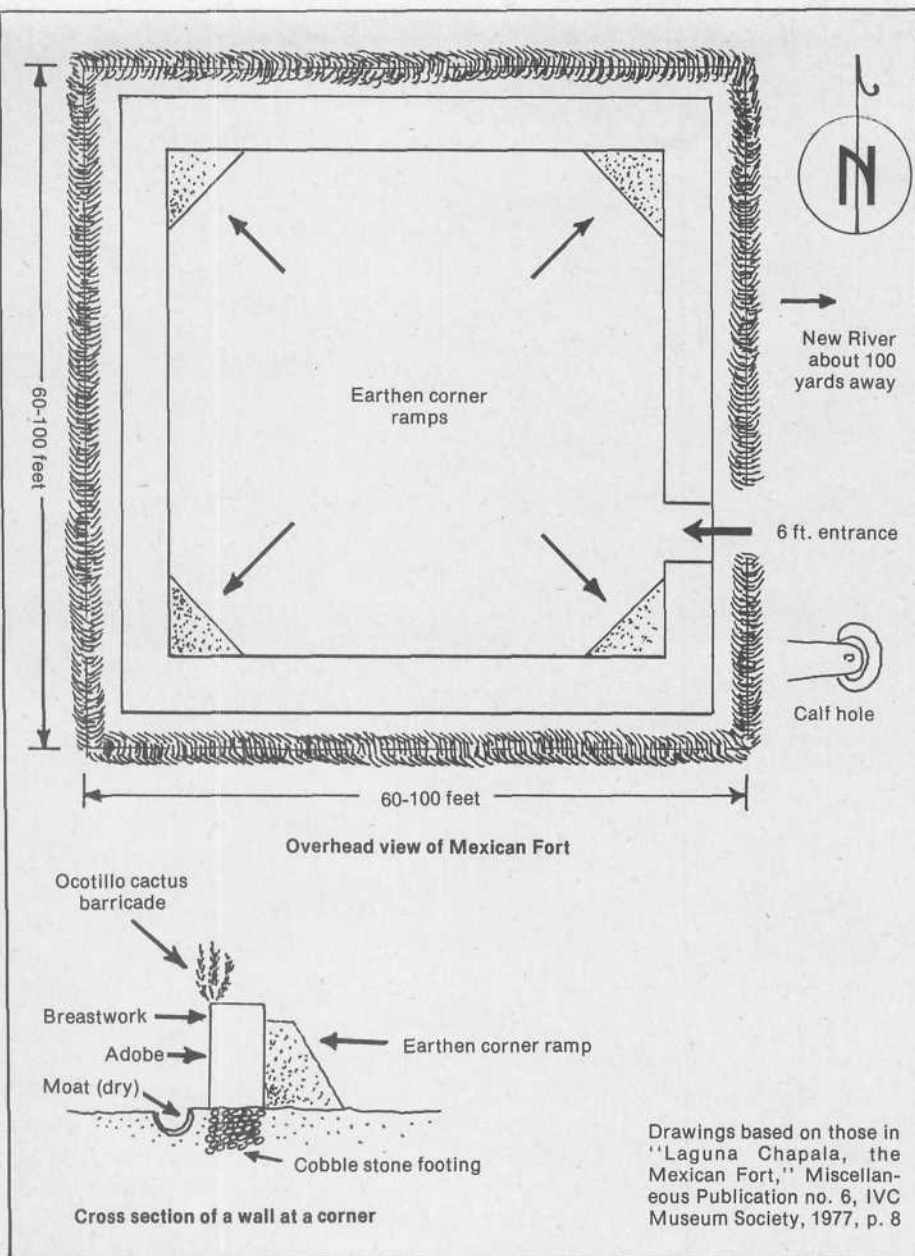
Early that December, Echeandria and Pacheco, with a force of cavalry, reconnoitered to the Colorado River via the Carrizo route. Together they selected the site for the fort at the area they named Laguna de Chapala — over 120 miles from its ordered site at San Gorgonio. Governor Echeandria left Pacheco and a

few of the cavalry at the site to begin construction and returned to San Diego.

The place they picked was well known to the explorers and travelers of the area. The site is adjacent to the present New River and Bull Head Slough. These "streams" were shallow standing water or muddy depressions most of the year then, but did flow in the spring carrying flood waters from the Colorado River to the lowest part of the Salton Sink. Here was lush grass for horses, standing water in the sloughs, and a high water table to make well-digging practical.

The fort site was due east from the mouth of Carrizo corridor and on a slight knoll in the desert. The Carrizo route, the Coyote Canyon route, and the San Gorgonio route all passed this area before diverging.

There was a village of Kumeyaay Indians nearby who were momentarily peaceful and they were hired as laborers on the project. The description recorded says they built a fort about 60 feet square with its only opening on the east wall, and that only six feet wide. Measurements taken in 1958, however, reveal a structure about 100 feet square. Archaeology should detect the exact size.



ly. News arrived in San Diego of an impending Indian uprising but was soon followed by a less-alarming dispatch that three chiefs from Vallecito, Cuaripe, Haluco and Cajaguaca, with 15 warriors had arrived at the fort proposing friendship. The situation had calmed for the moment.

By April however, the fort-building Kumeyaay had been provoked and they attacked their former employers along with the Mexican's newly acquired Vallecito allies.

With all the timing of a good movie, Lieutenant Pacheco returned in the nick of time with 25 cavalry lancers from his Mazatlan squadron. Together with the detachment at the fort, they counter-attacked. Mexican lances, sabers, and a few muzzle-loaders faced Indian arrows, spears and clubs. Six troopers were killed and "various" others received arrow wounds. Twenty-eight Indians died at the battle and one captive was taken. As William M. Farris, I.V.C. Museum Director has written of the battle, "though the fighting was inconclusive the results were decisive; the fort was abandoned."

After the battle, this first attempt at non-Indian settlement in the Imperial Valley was all but forgotten. The next mention of the fort is in the July, 1891, *Riverside Press*, which said there was a "rude" fort in ruins, but still standing. Mesquite trees and a pool of water (the old calf hole?) were also reported at the site.

About 1900, the first settlers began arriving in the Imperial Valley. Some noticed the old ruin and fanciful tales sprang up about it. The *Imperial Press* in 1901 said: "History of the fort would be interesting were it possible to read it." The account suggested that the fort may have been built to protect stages carrying U.S. Mail. (The old Butterfield line ran through the area in the 1850's and 60's.)

The *Imperial Press and Farmer* in 1902 gave the fort a headline worthy of *National Inquirer*: "Was a Catholic Priest Burned at the Stake?" It went on to describe a charred mesquite post at the site surrounded by burned human bones and teeth. A "legend" (probably made up on the spot) was then related that a "Spanish expedition was overpowered by savages, the entire party perishing save the priest who was trans-

The Mexicans also dug "calf holes," which are ramps descending to the water table like a well for animals to walk into to drink.

During the last week of December, 1825, Lieutenant Pacheco's report from Laguna de Chapala predicted completion of the fort in one month. By the end of January, Pacheco was back in San Diego and apparently one Ignacio Delgado was in charge at the fort.

The situation deteriorated immediate-

A test trench dug at the fort. The ridge in the middle was probably a wall. The original walls were adobe, five or six feet high, possibly with some earth on top. The walls had cobblestone footings and a palisade of thorny Ocotillo branches.

lated (sic) to heaven without suffering death."

Some time after 1958, when Sheriff Hughes had surveyed the area, the remaining walls were leveled by a farmer's land plane. A simple hole or any disturbance of the soil becomes a surprisingly permanent feature in that it always retains a different character than the surrounding soil. For this reason, after every rain, weeds still grow thickly following the now invisible wall and create an outline of the old fort.

IVC Museum's first project was to raise money to fence the site which they did through private donations. With the new fence in place, in late Spring of 1977 a number of test trenches were dug at the site to locate the greatest perimeter of the walls.

The Museum is awaiting arrival of a resistivity meter before excavating further. This is a device to record underground objects. An electrical current is run between points and the resistance to each charge is plotted. As the points are moved, changes in the resistance are detected. Since underground obstructions cause this variation, the final chart reveals where the obstructions are and the archaeologists know where to dig. Once the long overdue device arrives from England full-scale work will start.

The soil at the area is very acid and many artifacts may have dissolved away. Buttons, guns, coins, leather goods, etc., are the type of objects that would logically be left behind when a fort is hastily abandoned. Such finds could yield enormous information.

Possibly the burial sites of three Mexican soldiers listed as killed but not listed as returned to San Diego for burial might be found. It was the Mexican military practice to bury soldiers outside the walls but inside the surrounding moat. If these are found, it should be of great interest to the Mexican government to recover the remains of war-dead.

Trash, which garrisons customarily buried, might also be found.

The Museum currently favors a plan to have students reconstruct the fort using hand-made adobe bricks when all the excavation is completed. When their rebuilding is finished, Imperial County will have a monument unlike any other in the state, and Laguna de Chapala will begin adding to its long-suspended history.

□



Above: Confluence of the New River and Bull Head Slough, S.E. of the site about 200 yards. The towers of the El Centro Naval Air Facility can be seen in the background. Below: The carefully staked grid system for excavation purposes.



Late Spring On Lower Desert Brings Unexpected Delights

by BILL JENNINGS

YOU MIGHT not think that late spring—May and even early June—would be a good time to sample the myriad attractions of California's Anza-Borrego Desert State Park, but give it a try.

You could be happily surprised at the mildness of the days and the coolness of the nights, and this is still wildflower season.

In fact, two of the prettiest bloomers, the dark blue smoke tree, and its vivid darker cousin, the precisely named indigo bush, are just getting started. The verbena, morning glory, Mojave aster, several cacti and the towering agave and yucca are still in their glory.

Besides, the big—nearly 900 square miles by latest measure—park is blessed with a number of fine, higher-elevation campgrounds that are accessible by conventional car, over fair to excellent roads.

This time of year you'll find plenty of room at Culp Valley, just up the scenic Montezuma Grade from park headquarters in lower Palm Canyon, at some 3,300 feet in elevation. Further south, there is Blair Valley, over 2,500 feet. Both are rated as primitive camps but that's not to say they aren't equipped, particularly with scenery.

Many experienced desert campers save their lingering trips, those three-

day affairs, for this time of year in the Borrego country. Many campers stay away, for no good reason I can think of, and there will be a better pick of campsites, no crowds at Font's Point and you'll have the Bill Kenyon scenic overlook trail all to yourself as you thread Yaqui Pass, site of another relatively high-elevation, albeit primitive, roadside camp.

By the time this story appears, in the May issue, out in late April with luck, you'll have your choice of two excellent guidebooks to the Borrego country. Lowell and Diana Lindsay's model, "The Anza-Borrego Desert Region," subtitled "A Guide to the State Park and Adjacent Areas," has been out several months.

George and Jean Leetch's new edition of the historic (1957) Horace Parker "Anza-Borrego Desert Guide Book" is due out under auspices of the Anza-Borrego Natural History Association. There's no choice for most of us Borrego fans. We have to own both.

And the park association has provided another great wrinkle, cheap reprints of the trusty 15-minute series topographical maps put out by the U. S. Geological Survey.

Books, maps and a lot of free, but excellent, advice are available at the park's new Visitors Center, which opened in

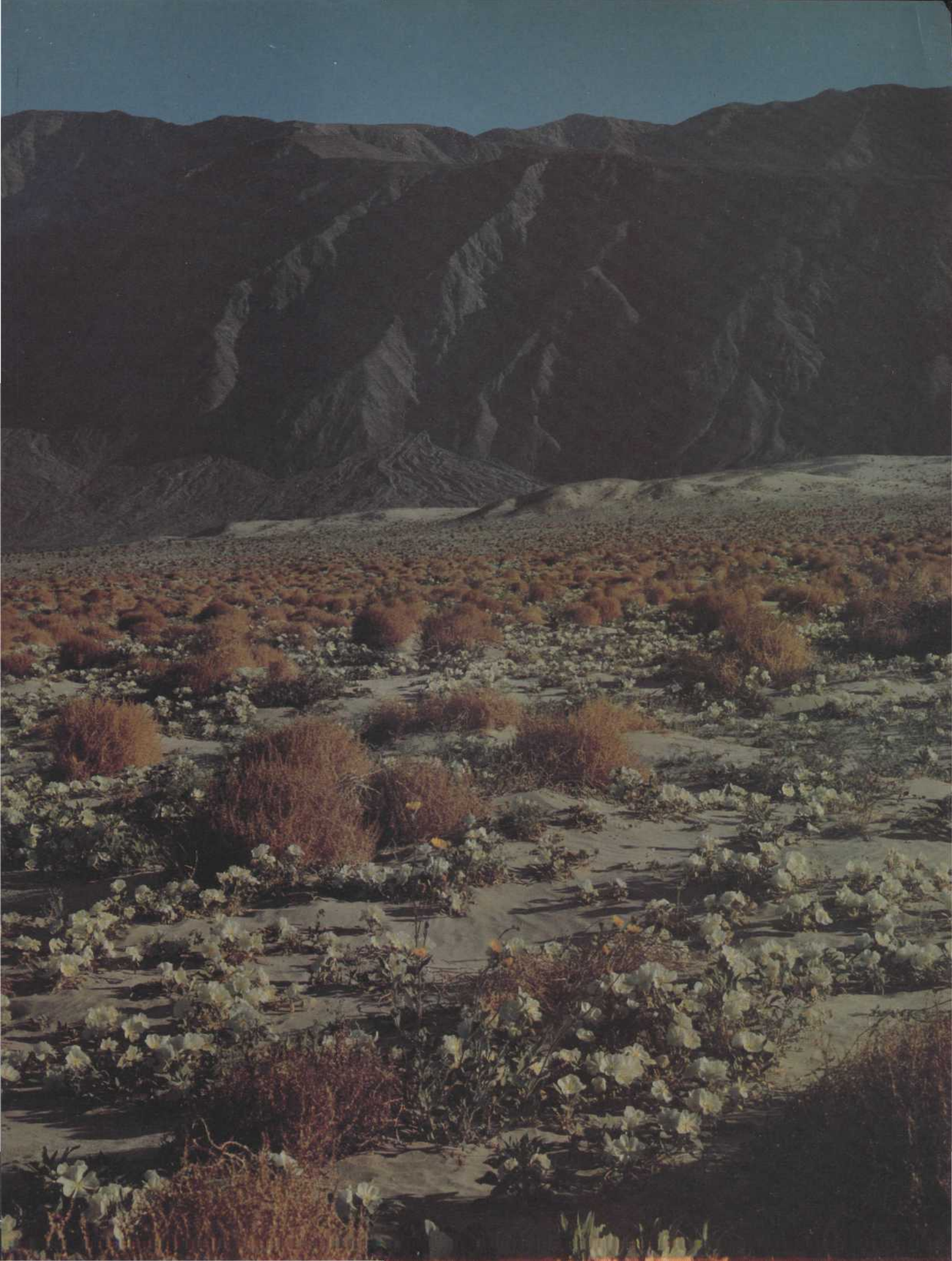
mid-March. All of the permanent displays in the energy-conserving building are not yet installed but some of the goodies, particularly a spectacular audiovisual program were scheduled for completion about now.

The new building is a success story of rare vintage. The state and federal governments put up about half of the estimated million-dollar investment and the rest came through the natural history group's efforts. Volunteers from the association also staff the handsome stone and concrete dugout style structure, located at the entrance to the Borrego Palm Canyon campgrounds, near the park headquarters.

One of the newer attractions in the park that is drawing good attendance in late spring is the Anza Ranch horsemen's camp near El Vado (the ford) at the mouth of Coyote Canyon. This facility was added to the park in 1977 and provides corral space for up to 27 horses and 10 camping groups.

A system of trails connect the camp with nearby Collins Valley and lower

*Dunes primrose and tumbleweeds
on the Anza-Borrego Desert.*





Cattle watering pond also is a haven for deer and other wildlife on the Los Coyotes Indian Reservation near Anza-Borrego Desert State Park, a good late spring camping area for desert visitors. Photo by Bill Jennings.

Coyote Canyon and patrolling rangers keep horses and vehicles on their own specifically designated routes.

At the far east end of the park, near Ocotillo Wells, the state's first off-road vehicle recreation area has been added to the park system. Approved by the State Park and Recreation Commission in early 1976, the new site includes 14,000 acres north of State Highway 78 designated for off-roaders' primary use.

Casual visitors won't want to venture

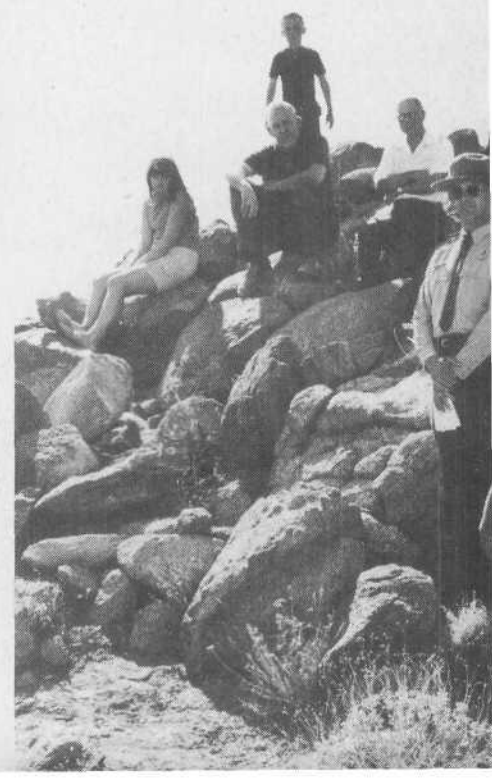
into the Ocotillo Wells State Vehicular Recreation Area anyway. Most of it is rough terrain best suited for four-wheelers and sand buggies.

Another area primarily used by off-roaders is the new Culp Valley section, more than 600 acres of the historic Paroli Ranch that provides a continuous jeep trail from Culp over the Jasper and Grapevine routes across the south ridges of the San Ysidro Mountains to State Highway 78 near the Yaqui Well and Tamarisk Grove campgrounds.

The coolest parts of the park for late spring visitors are also the least accessible, except via high-center or four-wheel-drive vehicles. This is the park's relatively new north end, Coyote Canyon in particular. This seemingly remote area is actually well traversed by old cattle and mining roads, but most are not intended for passenger cars. This part of the park is bighorn sheep country, and the park management closes the main routes in mid-June for the summer months so the sheep can have undisturbed access to Middle Willows, the only sure water supply in warm weather.

Blair Valley, the 2,500-foot-high bowl above Mason and Shelter valleys at the park's south end, is a good late spring site, and offers many side trips negotiable by sedan or compact coupe, into Little Blair Valley, south to San Diego County's Agua Caliente Hot Springs and

The late Horace Parker, guidebook author, former state park commissioner and noted desert conservationist, was a special speaker 10 years ago at the dedication of the Bill Kenyon Trail. That's Wes Cater, former Anza-Borrego Desert State Park manager, behind him.



Vallecitos Stage Station parks, or to the west up winding Banner Grade to the historic mining region around Julian, San Diego County's almost county seat back in 1870 when the mining boom was peaking.

As in the case with all these weekend trip reports in recent months, I strongly urge you to make advance reservations for any motel or other accommodations and also to inquire well ahead of trip time regarding scenic attractions such as wildflowers and road conditions, which can change relatively quickly in the wake of our occasional thunderstorms.

Anza-Borrego Desert State Park, of course, stays open all summer, if you're so inclined, and there's nearby Cuyamaca Rancho State Park in the cooler high country as well, plus the public camping and picnic facilities maintained by the Los Coyotes band of Mountain Cahuilla Indians at their high-country reservation near Warner Springs.

Another Indian camping area of great beauty and hospitality is just below the Lake Henshaw resort on State Highway 76, operated by the La Jolla Reservation. Lake Henshaw itself is a popular summer resort area, with boating and fishing and nearby Mt. Palomar with its famous 200-inch telescope, several state and county park camping areas and well-marked day loop trips.

When you think about it, late spring is



The view across Coyote Canyon and Lost Valley to the Santa Rosa Mountains is one of the scenic high points of a late spring visit to the Anza-Borrego Country, from Los Coyotes Indian Reservation.

just about a perfect time to visit the low desert, as long as you leave yourself an escape hatch, in the form of ample roads and accommodations in the nearby San Diego County high country!

With the present gas allocation problems, it's a good idea to map your route carefully. Many of the crossroads service stations have been closing on weekends, so keep a relatively full tank by stopping wherever you can. Again, a call to park headquarters at Borrego Springs, or any

of the other numerous state and county, Indian and private sites is well worth the effort.

If you don't find the bee-mecca smoke-tree in bloom when you come down, you may be a little early, but the indigo will make up for it, along with the many other late annual and perennial blooms, particularly in the higher elevations — and you can always take in the annual Julian Wild Flower Show, a mountain tradition this time of year. □



JACK MITCHELL AND

IN 1929, while prospecting for silver in Southern California's Providence Mountains, Jack Mitchell became fascinated with what were then called the "Providence" or "Crystal" caves. In 1932 he decided to close down his depression-haunted business in Los Angeles and move to the desert. For a time he worked at various silver mining projects, but his real interest was in the caverns and their tourist potential. He built a road and several stone houses that are used to this day, and until his retirement in 1954, he and his wife, Ida, provided food, lodging, and guided tours of the caverns to a small but steadily increasing number of visitors.

Famous for his highly entertaining tall tales, Jack Mitchell also gave the caverns their present names: El Pakiva, the Devil's House; and Tecopa, after a Shoshonean chieftain. Subsequent to Jack Mitchell's retirement, the State of California became owners of the picturesque caverns, and it is now part of the Providence Mountains State Recreation area.

Providence Mountains State Recreation Area, which includes Mitchell Caverns Natural Preserve, is located about 80 air miles east of Barstow in the center of a vast, arid, sparsely populated portion of the eastern Mojave Desert.

This area, from Barstow on the west to the Colorado River on the east and including all the land between the two major east-west highways (Interstate 15 and 40), is known to local residents as the "lonesome triangle." It is sun-scorched land of broad valleys filled with creosote bush and cactus, sand dunes, cinder cones and dramatic pinon-clad mountain ranges.

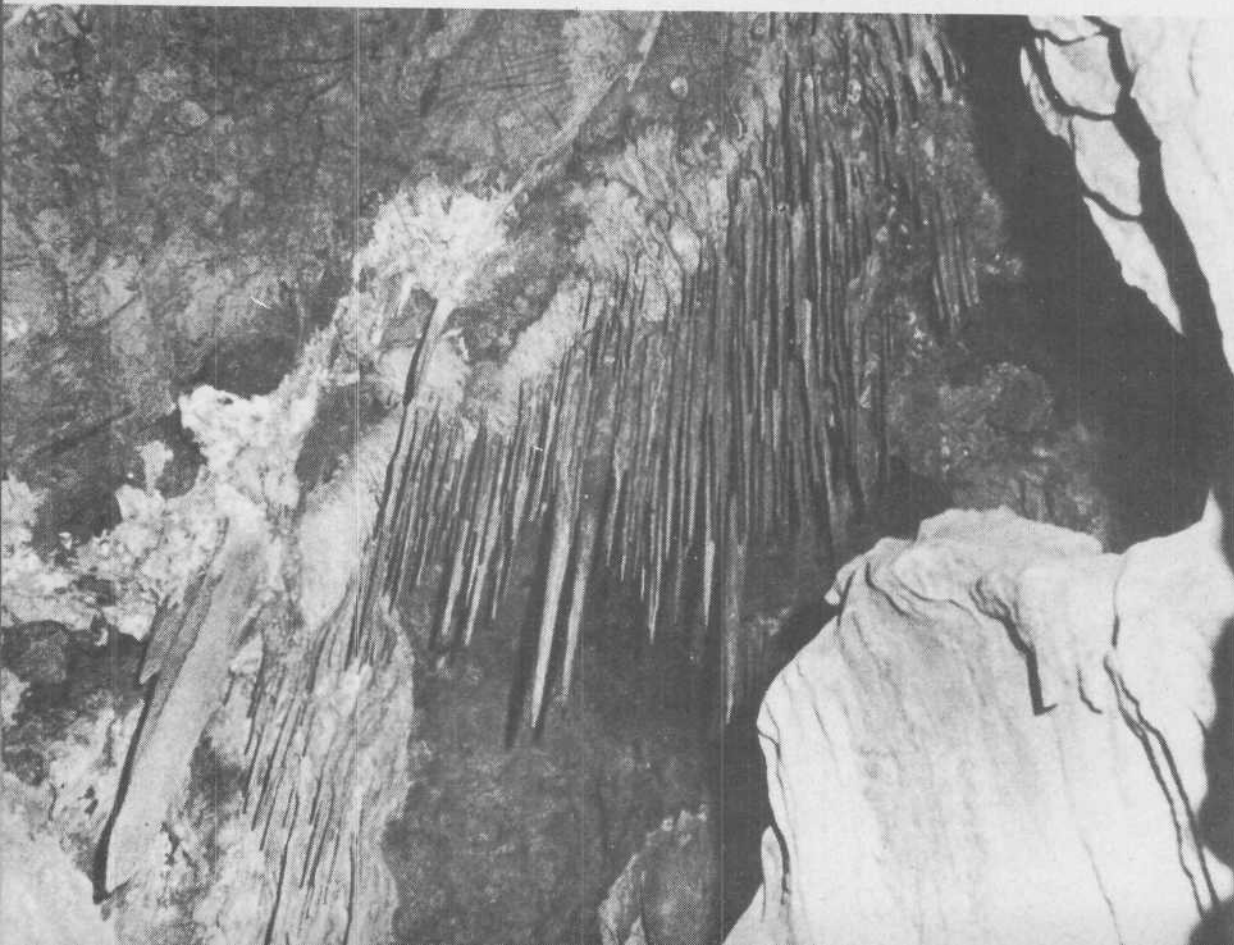
The 5,900-acre recreation area is situated on the eastern slope of the Providence Mountains where the land sweeps up from Clipper Valley to high, heavily weathered, rhyolite crags ranging to 7,171 feet in elevation.

Park headquarters at 4,300 feet overlooks some 300 square miles of desert valleys and mountains. At times it is even possible to see the Hualapai Mountains in Arizona some 85 air miles to the

east. Due in large part to the elevation, temperatures in the park are relatively moderate the year around though the months from October to May are most favored by visitors.

The caverns are filled with intricate limestone formations and remain an almost constant 65 degrees in all seasons. El Pakiva and Tecopa Caverns are open to the public and have been equipped with stairs, railings, and special lighting to facilitate the guided tours that are conducted on a daily basis by the park staff. Entry to Winding Stair Cave, on the other hand, is restricted to experienced caving groups that have first obtained a special permit. This cavern goes down some 350 feet in a series of free-fall drops that vary in height from 50 to 140 feet.

Archeological work in the caverns turned up the bones of a Pleistocene ground sloth, one of the prehistoric animals that apparently ranged this territory and used the caverns during the late Pleistocene Epoch some 10 to 15 thousand years ago.



Researchers calculate it takes between 500 to 700 years to form a cubic inch of the icicle-type stalactites in Tecopa Cavern. Photo by Mary Hill.

HIS CRYSTAL CAVES

A LOOK AT MITCHELL CAVERNS AND THE PROVIDENCE MOUNTAINS

Rivaling the famous Carlsbad Caverns, Mitchell Cavern's remote location doesn't get the attention of the former, but the formations are of equal beauty.

Photo by California Department of Parks and Recreation.

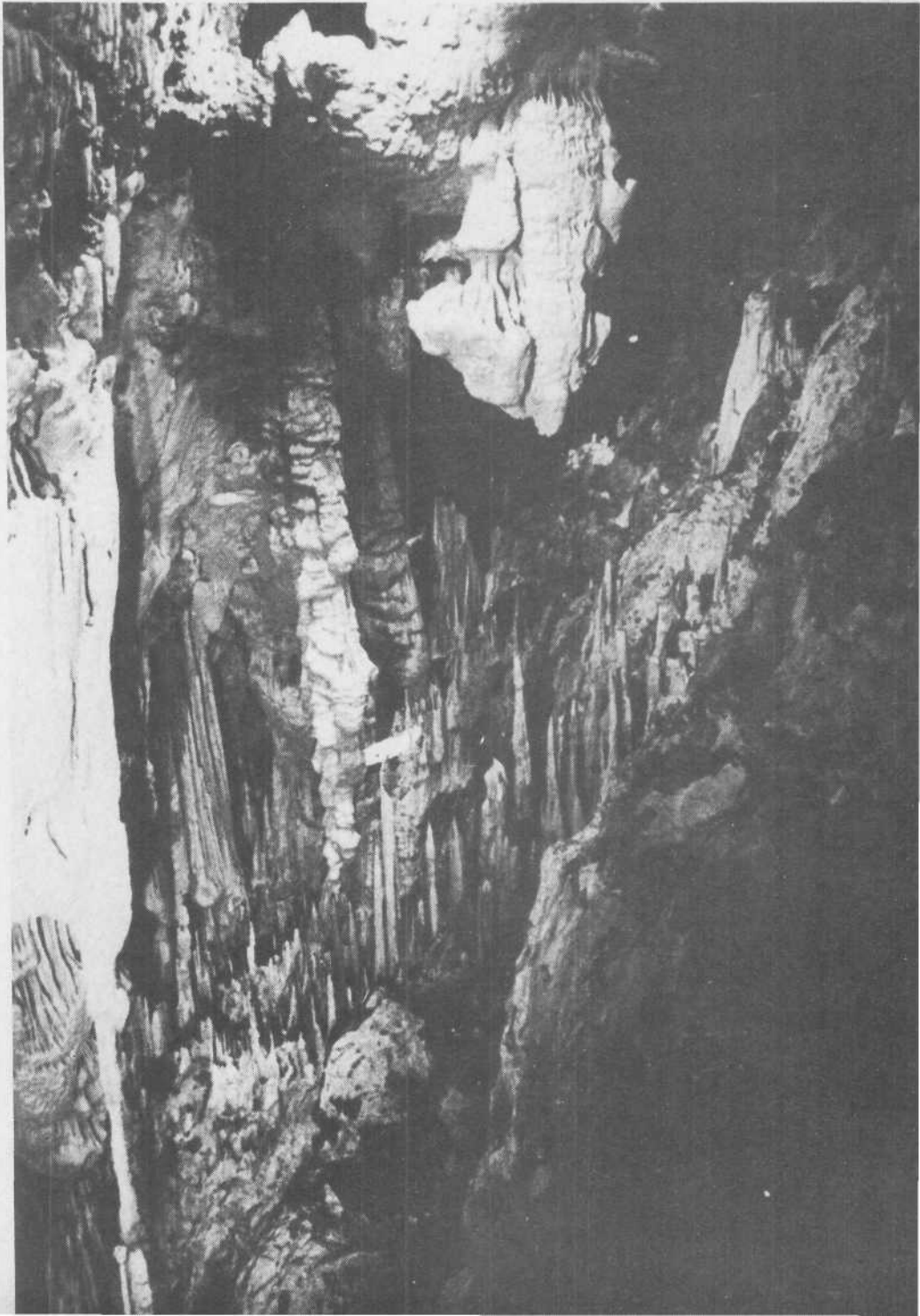
by CHARLES TALIAFERRO

Indian artifacts indicate that human beings have been using the caverns for at least 500 years. The smoke-blackened walls, hidden caches of food, tools, and other artifacts show that the Chemehuevi Indians used the caverns at least on a seasonal basis while hunting for game. They also collected the nuts of the pinon pine and used many other desert plants for food or medicine.

The first European to visit this part of the desert was Father Francisco Garces, who crossed the Mojave in June 1776, in order to visit San Gabriel Mission. There is no record of another European crossing the Mojave until 50 years later when Jedediah Smith led his party of fur trappers along the same route into California.

In the early 1860s, the United States Army built a wagon road, the Mojave Road, from the port of Wilmington to Fort Mojave on the Colorado River. Camps were established at springs that were approximately one day's travel apart. Remnants of some of these camps are still visible a few miles north of the park. Then, after the Civil War, silver was discovered in the vicinity and prospectors and miners began to arrive. Numerous diggings were begun, and a number of mines established that continued to operate until the silver market crash of 1893.

Near the visitor center, the Mary Beal Nature Trail offers visitors a wonderful opportunity to become acquainted with some of the plants and other natural features of this desert landscape. The trail is self-guiding and forms a loop about a half-mile long. Because of the



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The Park Headquarters, is located in this old building originally built by Jack Mitchell for his living quarters. The broad vista from the front porch is worth the trip itself. The metal triangle hanging from the porch's ceiling once announced the daily meals. Photo by California Department of Parks and Recreation.

The Cavern entrance [below] bids visitors welcome.

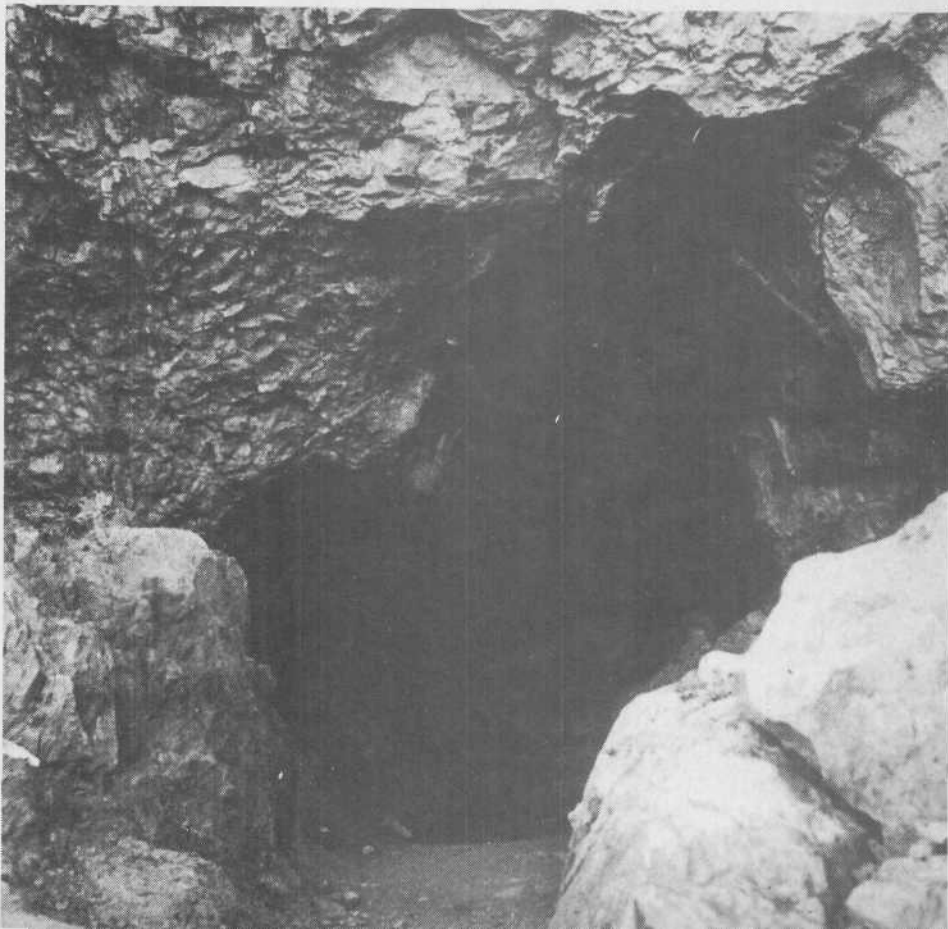
The cave is well lighted for you to view nature's wonder, with guard rails for protection against having a mishap.



trail's favorable location, a good sample of the region's plant life and other natural features can be seen.

For those who would explore further, there is a trail up into the Providence

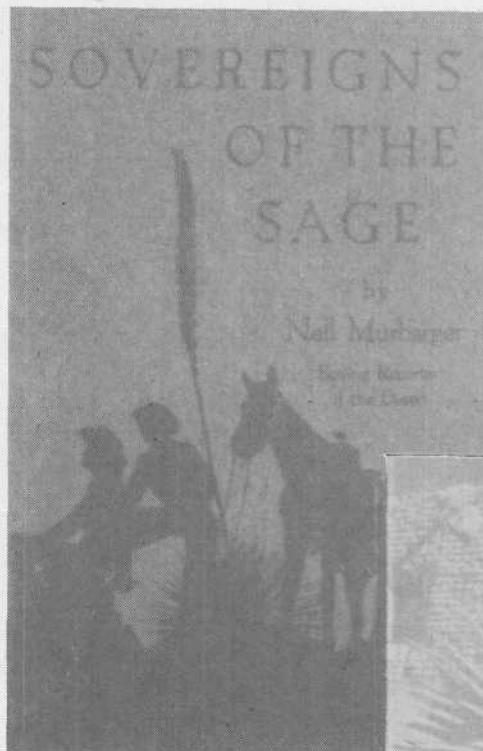
Mountains by way of Crystal Spring Canyon. Above the spring, the slopes are steep and rugged, and the panoramic view spectacular. Along with the drought-resistant single-leaf pinon



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pinos, there are junipers and scrub oaks. Perennials such as Mormon tea, cliff rose, squawberry, and blue sage share the upland areas with barrel cactus, Mojave and banana yucca, cholla and others. In the spring and early summer the wildflower display is likely to be delightfully rich and varied.

Wildlife includes numerous antelope, ground squirrels, cottontail rabbits, and various rodents as well as badgers, lizards, snakes and other small animals. Bighorn sheep are seen occasionally as are the extremely shy wild burros. Coyotes, gray foxes, bobcats and other small predators also live here. Gamble's quail, pinon jays, white-crowned sparrows, roadrunners and cactus wrens are just a few of the many birds in the area.

There are only six designated camping sites on the flat below area headquarters, and the water supply is limited. Much of the surrounding area is within the Bureau of Land Management's Piute Planning Area and is therefore open to camping.

The Park's staff will be happy to tell you about the back roads, and some of the natural and historic features that can be explored. Visitors are advised to bring a supply of water, as well as extra food and gasoline as a normal precaution when traveling in the desert. □

GHOSTS OF THE ADOBE WALLS

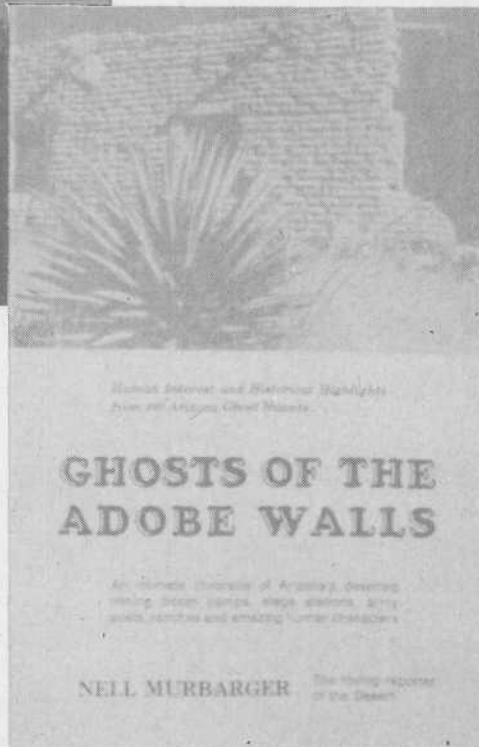
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New Mexico's Forgotten

I HURRIED UP the steep, narrow trail, panting like an out-of-shape mountain climber. Topping the mesa, the sun was setting over the rim of the Jemez Mountains behind me. My heart pounding in the high altitude, I headed for the ruins, still half a mile distant. The last rays of sunlight skittered across the level rock as I reached it, now breathing too hard, shaking too much to take the picture I had planned in my mind's eye. I gave up and recorded the view in my memory instead.

To the south, the lights of Santa Fe were winking on, visible through a gap in a far mesa. Ahead of me, directly east, were the Sangre de Cristos, turning the deep maroon which inspired their name. Nearer, the Espanola Valley spread its dark blanket over its residents, many, no doubt, descendants of the buildings of this adobe city. Behind me, floodlights lit up Los Alamos, part of the security network for the top secret work which has been going on there since its construction during World War II. (It was in this town that "Fat Boy," the first atomic bomb, was perfected.)

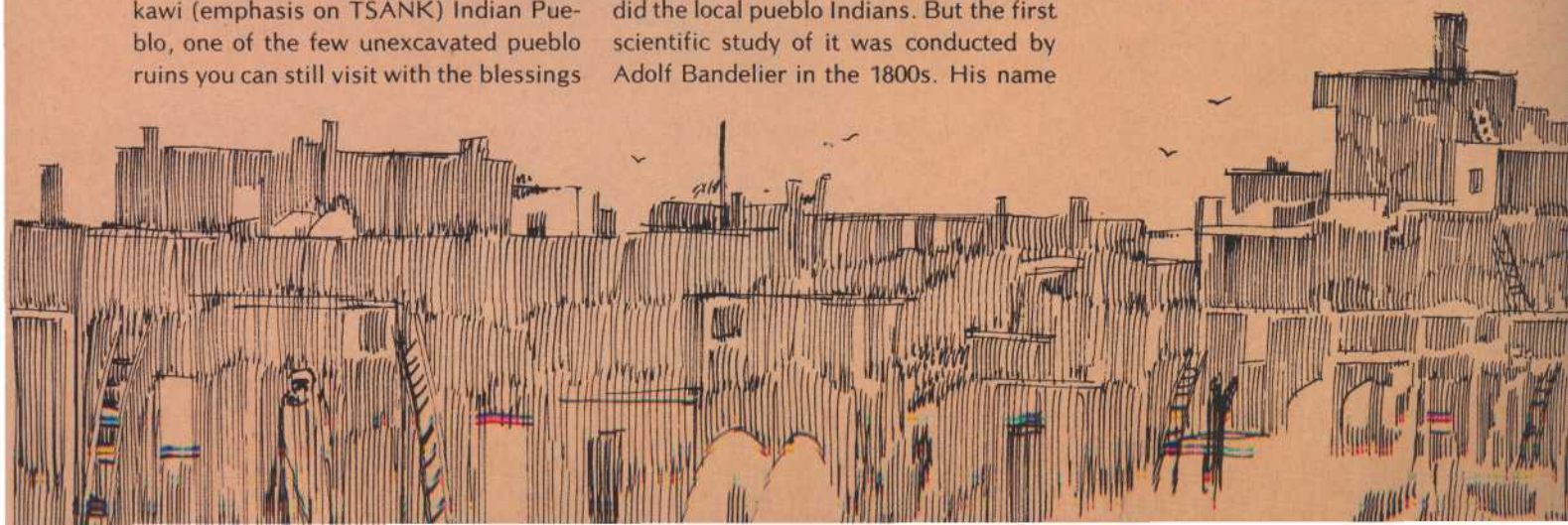
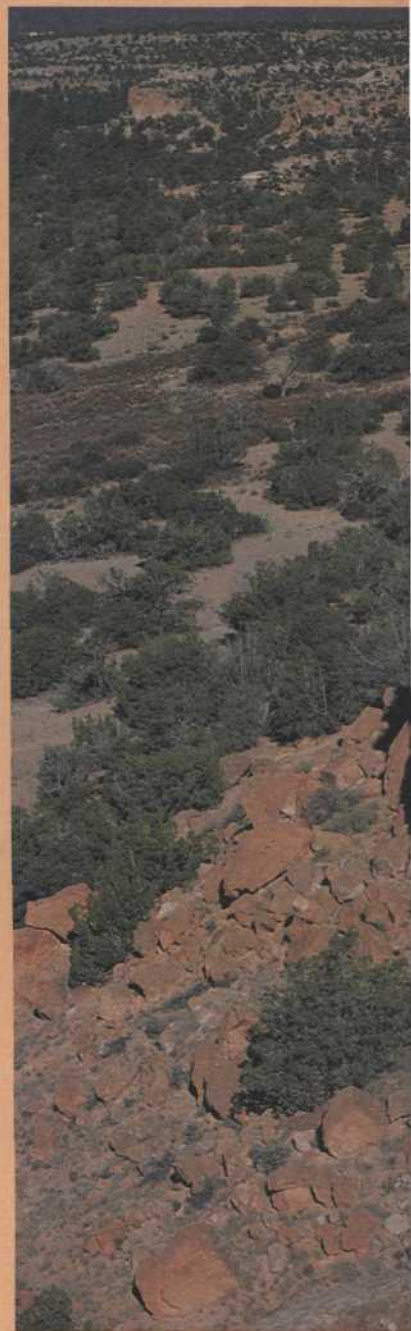
All around me were the indicators of modern civilization, yet here I stood, alone except for the small group of friends who had come with me. We gazed at the ancient ruin in front of us, built and abandoned while white settlers were still struggling for a foothold on the eastern shore of the continent. I've been here numerous times before, but I like it best at dusk. It is then that I feel most the presence of the original inhabitants of this old, forgotten, "sky-city" of northern New Mexico.

I was standing at the site of the Tsankawi (emphasis on TSANK) Indian Pueblo, one of the few unexcavated pueblo ruins you can still visit with the blessings

of the National Park Service. No one knows for certain who they were, the original dwellers here. The present-day San Ildefonso Indians trace their ancestry in part to Tsankawi. Archeologists surmise that the mesa top was chosen for its defensibility, just as Acoma was. Perhaps several "clans" decided to move together here after battling with raiding Indian bands. If that was the case, they chose well. Like Acoma, Tsankawi sits atop a steep-walled finger mesa jutting out from the Pajarito Plateau. The only way up is a footpath so narrow you literally cannot put one leg in front of the other. (By the way, if you find this narrow trail too difficult, take the alternate route around the back of the ruin. The Park Service has thoughtfully provided a ladder up for your convenience.)

The mesa was inhabited rather late in history. The estimated building time ranges from 1200 to 1400 A.D. Probably not more than 500 people lived here at any one time, and the pueblo was abandoned around 1600. As with many other places, the reason the inhabitants left is a mystery, although tree ring data indicates there was a great drought all over the Southwest at that time. Perhaps water became more important than defense. If there were other reasons, they have not surfaced yet. The lack of water might have caused other problems, however, which could have contributed to the pueblo's decline, such as the erosion of the valley soil. Erosion continues to be a problem here, and you can see its effects even now on the surrounding countryside.

No doubt many cowboys roaming the neighborhood knew of the pueblo ruin as did the local pueblo Indians. But the first scientific study of it was conducted by Adolf Bandelier in the 1800s. His name



Sky City ... TSANKAWI

by JAMES E. LEONARD

has now been given to the park that administers Tsankawi, nearby Bandelier National Monument (see the October, 1975 issue of *Desert Magazine* for a first-hand report on Bandelier). Tsankawi was not excavated by Bandelier, however, and has not yet been excavated by anyone else. Except for a few guideposts the Park Service has put up, it remains the same as when the inhabitants left it. The two- and three-story walls have tumbled, filled in with sand and brush. The kivas remain large depressions in the ground. The area is scattered with pottery shards and chips from arrowheads, spears and axes. Better trained eyes than mine could probably find more, but the Park Service urges visitors to take nothing away from the site.

One thing you can take with you is the view. Anyone who knows of the Indian instinct for beauty might suppose that they chose the mesa less for its defensibility than for the breathtaking panorama. On a clear day (there are a surprising number in New Mexico) you can see all the way to the Sandias, looking like a gigantic tidal wave, frozen just as it was about to engulf Albuquerque.

The mesa itself is composed of a soft, porous rock called "tuff," the product of volcanic ash, spewed from the Jemez Mountains which are the outer rim of a gigantic extinct volcano. The natives took advantage of the soft rock to carve cool, comfortable caves into the walls of the mesa. The caves are curiously situated below the top of the mesa, but above the steep walls that form its foundation. Sort of semi-safe, they probably made good summer homes, cool, and not too far from the lower fields. The caves are still there, although the outer rooms, built up of adobe, have long since crumbled.

The soft rock also served as a primitive sketch pad for pictures, signs, warnings, or perhaps prayers. The sharp-eyed can still pick out the petroglyphs along the rock walls. The Park Service has pointed out one or two. You must find the rest yourself.

The "tuff" is responsible for yet another unique feature of this pueblo. Going to and from their fields, and to other pueblos where they carried on trade, the inhabitants had to climb up and down the mesa every day. They left behind them a remarkable set of trails, worn into the rock over a number of years. One of them is used by the Park Service today to lead visitors to the ruins, but if you look around, you'll find others. Walking these old trails, you can't help but think of the number of people, the numerous trips up and down it must have taken to wear them so deeply even in this soft rock.

The trails lead past a broad flat rock used by the tribe for domestic chores such as grinding corn and stretching skins, and then on down to the small valleys on either side of the mesa. Here the natives grew their crops: corn, squash and beans. The mesa top was and is soil-poor. The visitor can see plenty of pinon and juniper, rabbit bush and yucca, but little else could be grown there. The inventive Indians let nothing go to waste, though, and even these plants provided firewood, dyes and other useful products for their self-sufficient existence.

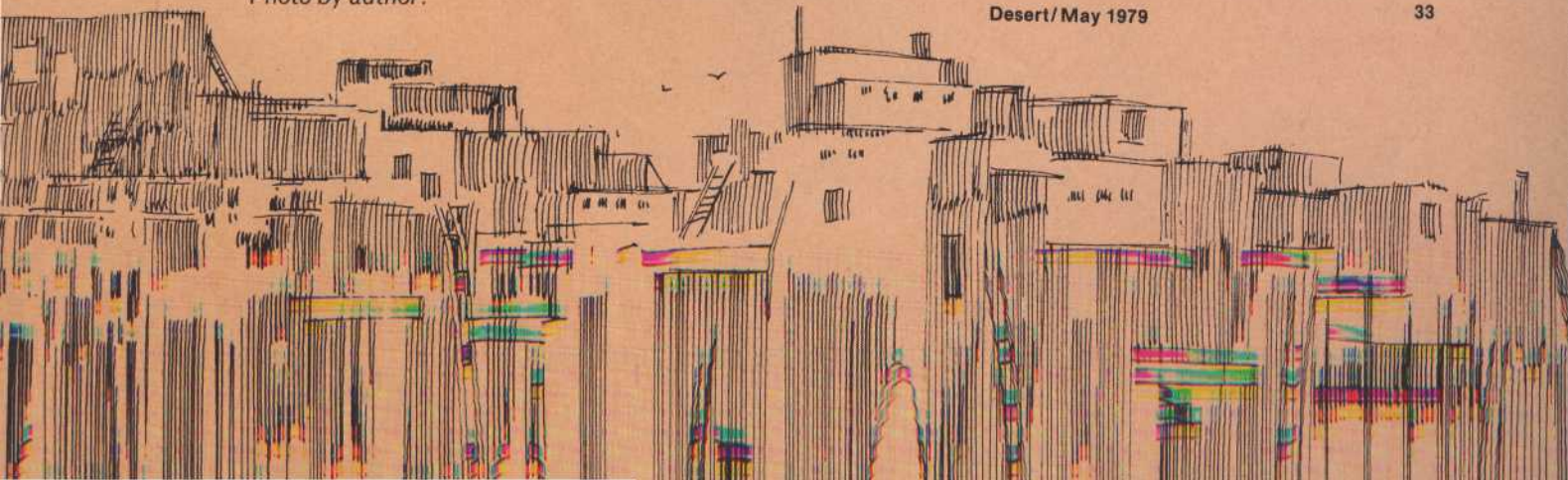
In spite of all it has to offer, Tsankawi remains a forgotten place. I have hiked its deep-worn trails dozens of times, and only twice have I met anyone. I asked Chief Ranger Al Ayers at Bandelier about the seeming dearth of visitors. His

Far below their hilltop stronghold,
the Indians cultivated crops.

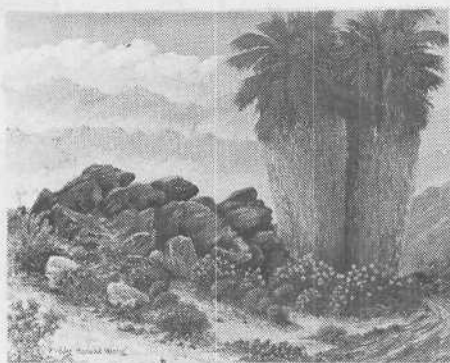
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Desert / May 1979

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figures confirm my observation. Although a quarter million people visited Bandelier in 1975, only a tiny percentage stopped at Tsankawi. This small number is particularly surprising since Tsankawi is right on the main road to Bandelier, only a few miles away.

A ranger I talked to at Bandelier thought people enjoyed seeing the rebuilt buildings and kivas at Bandelier, and having a tour guide to show the way; unexcavated ruins just didn't "turn them on." I think people are too lazy to get out of their cars and walk. The trail to Tsankawi is about a mile and a half, round-trip, not a difficult hike at all for most people. But I remember another trip, when, coming down from one of the most beautiful little waterfalls I'd ever seen, my wife and I were stopped by some tourists in a car and asked how far it was to the falls. On hearing that it was a quarter of a mile, they grumbled mightily at the lack of a road, and drove off. Since then, we've noticed that places requiring a hike of any distance are usually empty.

It's a shame that more people don't visit this lovely site, but on the other hand, I'm not sure this fragile ruin could stand the kind of crowds Bandelier draws. Soon, in order to protect the ruins

from the tourists, the Park Service would be required to put in asphalt walks, guides and the rest. Maybe Tsankawi is best left to those who enjoy seeking out things of beauty off the beaten path (no pun intended).

One thing Bandelier does provide are good camping facilities closeby. Visit Tsankawi from about mid-March (depending on the weather) through the first of November, and you can camp at Bandelier and enjoy, along with your children, the special evening programs provided by the rangers there. Ranger Ayers cautions that these are fairly primitive campsites, though, with no showers or hookups. You can also find camping sites in the Santa Fe National Forest, on the west side of the Jemez Mountains, but these are much farther away (about 15 miles west of Tsankawi), and even more primitive.

For those who want greater comfort, motels and restaurants are available in White Rock, Los Alamos and Santa Fe. All are within easy driving distance.

To reach Tsankawi, take U.S. 64 north out of Santa Fe about 15 miles. Turn west at Pojaque on State Highway 4 and head into the hills about 12 miles. Here the road splits, the right going to Los Alamos, the left to Bandelier and White Rock. Bear left and continue about a mile. You'll see the sign for Tsankawi on the left hand side of the road.

There is roadside parking, and a gap in the fence to enter. At the entrance are flush toilets, a small office (a ranger is on duty during summer daylight hours), a picnic table and a small booklet rack with a guide to Tsankawi. The booklets are sold on the honor system and well worth the small expense.

Wear solid shoes with good gripping soles. Remember the altitude and adjust your pace accordingly. Be sure to take a flashlight in the evening.

Hike the trail just before dusk (about 8:00 p.m. in summer) as I did, and stand at the ruins alone. There is light for about 45 minutes after sunset, so you can still see everything. The view from the ruins will fill your eyes with color. It is a moment of beauty I carry with me always. Best of all, you'll experience the wonder Adolf Bandelier must have felt on first seeing Tsankawi. No paved walkways, no crowds, no cars, not even a guide. Just you, nature, and the ghosts of Tsankawi. □

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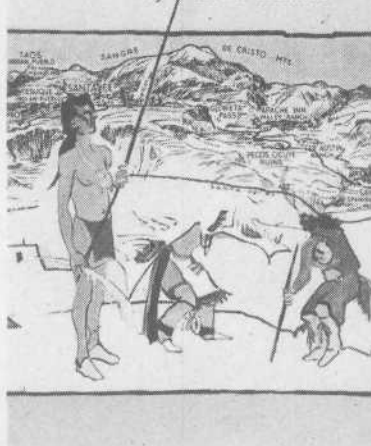
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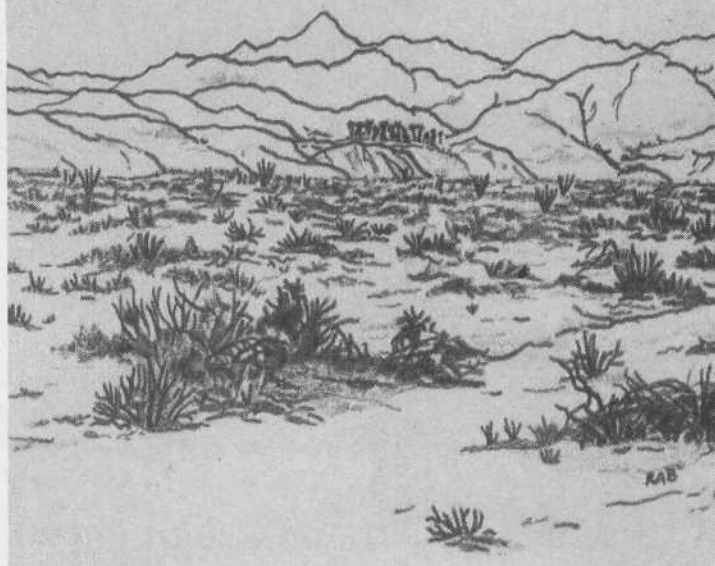
ALTHOUGH HIDDEN from view at the Pygmy Grove, the Southwest oasis become partially visible after only a minute's hike upstream from the dwarf palms. The canyon curves left, then right, finally ending in a small bowl where springs nurture a large native palmery. I counted 118 trees, but this rough total included only those over six feet tall. Many smaller palms grow here, too, along with numberless seedlings only inches high, facts which indicate that the oasis is on the increase.

Groves sometimes gain or lose large numbers of trees over a span of a few years in response to changes in available moisture. Wet years, dry cycles and the effects of earthquake fault activity on the underground water supply all play a part. Fortynine Palms in Joshua Tree National Monument is another expanding oasis; Fern Canyon near Palm Springs and Palm Wash in the Borrego Badlands exemplify declining stands.

Fire has singed many of the Washingtonias, some of which are 30 to 40 feet in height. Several fallen trunks contrast with the vertical lines of the living forest.

This palm-shaded cul-de-sac overlooks the historic Carrizo Corridor—or "Slot," as it is known to prospectors—along the Southern Emigrant and Butterfield Overland Mail trails. Here the transcontinental routes followed Carrizo Wash as it cut a relatively narrow swath between the Fish Creek Range on the north and

*The Southwest Grove
at Mountain Palm
Springs as seen from
Highway S2.
Sombbrero Peak
in background.*



the Coyote Mountains on the south. How much history has left its imprint on the sands of the Carrizo! There is a faint possibility that Lieutenant Emory with Kearny's Army of the West was referring to the Southwest Grove when he mentioned palms in his diary back in 1846. It seems much more likely,

MILEAGE LOG

- 0.0 Junction of San Diego County Road S2 and good dirt road to Mountain Palm Springs Primitive Camp in southern part of Anza-Borrego Desert State Park. This junction is one mile south of turnoff to Indian Gorge and Valley. Turn right and drive to primitive camp.
- 0.6 Dirt road ends at primitive camp at base of Tierra Blanca Mountains. Pygmy Grove is a few hundred yards up the arroyo which enters campground from left. Southwest Grove lies less than half a mile beyond the pygmy palms at an elevation of about 1020 feet.

though, that Palm Spring, a few miles to the north along the overland trail, was the oasis he was describing.

A good-sized pool much visited by wildlife moistens the upper part of the grove, and along the left edge of the

oasis water trickles down a sheer-walled gully packed with sedges and Washingtonias.

Mesquite and catsclaw are found at the oasis, with ocotillo and cacti on higher ground. I also noted two willow trees and a solitary tamarisk. The non-native tamarisk, introduced from North Africa early in this century for shade and wind-break purposes, has escaped to many a wash and waterhole in the desert backcountry. The state park's Tamarisk Grove Campground off Highway 78 is shielded by this alkali-tolerant, drought-resisting tree, several species of which now thrive in the United States. Two puffy elephant trees mark the hillside to the right of the palms.

I checked a shallow cave on the opposite side of the oasis for Indian signs, but found none. In fact, I saw no potsherds or artifacts of any kind at the Southwest palms, although I'm sure the Dieguenos took advantage of the grove's water, shade, game and palm fruit.

After retracing our steps to the Pygmy Grove and Mountain Palm Springs Primitive Camp, we'll next explore the long and narrow North Grove, then neighboring Surprise Canyon and Palm Bowl. □

Pyramid Lake's Lost Sister

by ERIC MOODY

ONE OF THE most spectacular sights in the West awaits those who journey to Nevada's Pyramid Lake. Every year thousands of visitors make their way to its sandy shores for boating, fishing, swimming, or simply to enjoy its broad rippling vistas. It has been a famous attraction ever since Captain John C.

Fremont and his exploring party, ranging southward from Oregon in 1844, came over the crest of a desert mountain range and found a wide sheet of green water that "broke upon our eyes like the ocean." To Fremont, the unexpected lake was "set like a gem in the mountains.

Pyramid Lake still is as awe-inspiring as it was in Fremont's time. However, many of those who visit it today find in the encounter a poignancy that Fremont could not have known, for they are aware that the lake is slowly drying up. Emotional reactions would be even greater if more than just a handful of the visitors knew that, as recently as four decades ago, Pyramid had an equally fascinating companion — a sister lake which experienced the same fate forecast for it. This was Winnemucca Lake, which paralleled Pyramid, just to the east beyond the Lake Range. Like Pyramid, Winnemucca was a remnant of prehistoric Lake Lahontan, the inland sea that once covered much of the Great Basin.

Even before its eventual disappearance in this century, Winnemucca Lake, or Mud Lake as it was originally known, was not a stable body of water. It experienced many fluctuations and even dried up at times before its written history began. Winnemucca was probably dry in 1844, for Fremont, who observed the area from the mountain peaks, made no mention of it in his reports.

In the late 1850's there seems to have

been some water in the lake, and by the early 1860's — largely as the result of an increased flow in the Truckee River during 1861-62, the lake bed was covered to a considerable depth. Both Winnemucca and Pyramid Lakes received virtually all of their water from the Truckee, whose flow divided on a delta at the southern end of Pyramid. Water was channeled into Winnemucca through Mud Slough at the southern terminus of the Lake Range. During some years Winnemucca received no water; in others, when the channel into Pyramid became blocked, it received all the water in the river. In very wet years, such as 1868-69, Pyramid overflowed into Winnemucca through Mud Slough.

Winnemucca Lake continued to gain water during the last third of the 19th century. In 1867 its surface was 80 feet below that of Pyramid; by 1871 it was only 58 feet lower. During 1876 the Truckee River's outlet to Pyramid Lake was closed by a gravel bar, or by a shoal of sawdust and debris from sawmills upstream, and the entire flow of the river went to Winnemucca Lake. An 1881 history of Nevada reported that sawdust blockage at the mouth of the river was, at that time, causing more water than usual to flow into Winnemucca.

When Israel C. Russell examined the two lakes in September, 1882, he found Pyramid to be 30 miles long, 12 miles broad, and covering an area of 828 square miles. Winnemucca Lake was 29 miles long, with an average breadth of three and one-half miles and an area of approximately 91 square miles. Russell noted, also, that the water of both lakes was saline and alkaline.

Winnemucca, like its companion lake, supported large populations of fish and water fowl. The Paiute Indians of the area fished from small handmade boats on Winnemucca's surface and hunted along its shores, but there was more abundance than they could use. In November, 1889, a Reno newspaper reported that W.D.C. Gibson had bought and shipped 23,000 pounds of trout from Pyramid and Winnemucca Lakes during the preceding eight weeks. It is known



Remains of "paddle-wheel steamer" on dry bed of Winnemucca Lake. Photo Nevada Historical Society.

that at least one white commercial fisherman worked Winnemucca Lake, for in 1953 explorers along the lake shore entered a small cave and found a cache of old fishing equipment, which included, among other things, oarlocks, a can of blue boat paint, two inch fish hooks, line, and shuttles for repairing nets. A copy of an 1889 newspaper found with the cache suggests that its owner may have been one of the anglers who supplied Mr. Gibson with his trout that year.

The anonymous fisherman and the Paiutes were not the only ones who navigated Winnemucca's waters. In 1877 a steamboat, the *Wm. Jamison*, was launched on the lake. The property of James Kinhead, the vessel was reported as being small, but capable of doing "ten miles to the hour, which is good time for a boat of her size." A photograph taken on the dry bed of Winnemucca Lake in the middle of the present century shows the remains of a vessel identified as a "paddle-wheel steamer," but there is no evidence as to whether or not it is the *Wm. Jamison*.

Winnemucca Lake increased in size and depth into the 1890s, but thereafter its story — as well as that of Pyramid — is one of decline. Use of the Truckee River water for irrigation of farm lands steadily increased after 1860, and beginning in 1905 even more of the river's flow was diverted to the Newlands Reclamation Project through the Truckee Canal. After 1911 only intermittent flows made their way through Mud Slough.

In 1921 the Nevada legislature declared the receding lake a navigable body of water as part of an attempt to give the state title to its bed. This was in connection with a plan to reclaim some 75,000 acres in the area and settle World War I veterans on them. Nothing came of the grandiose project.

By this time it was clear that the lake was dying, though its fish and wildlife remained plentiful. Mudhen huts were held there at least as late as 1927, and until the mid-1930s there were many fish. The presence of large numbers of ducks and geese in the marshes bordering the lake led, in 1936, to the creation of a Winnemucca Migratory Bird Refuge. (Renamed the Winnemucca Wildlife Refuge in 1940, this 65,000 acre federal preserve remained in existence until 1962, long after the lake had vanished.)

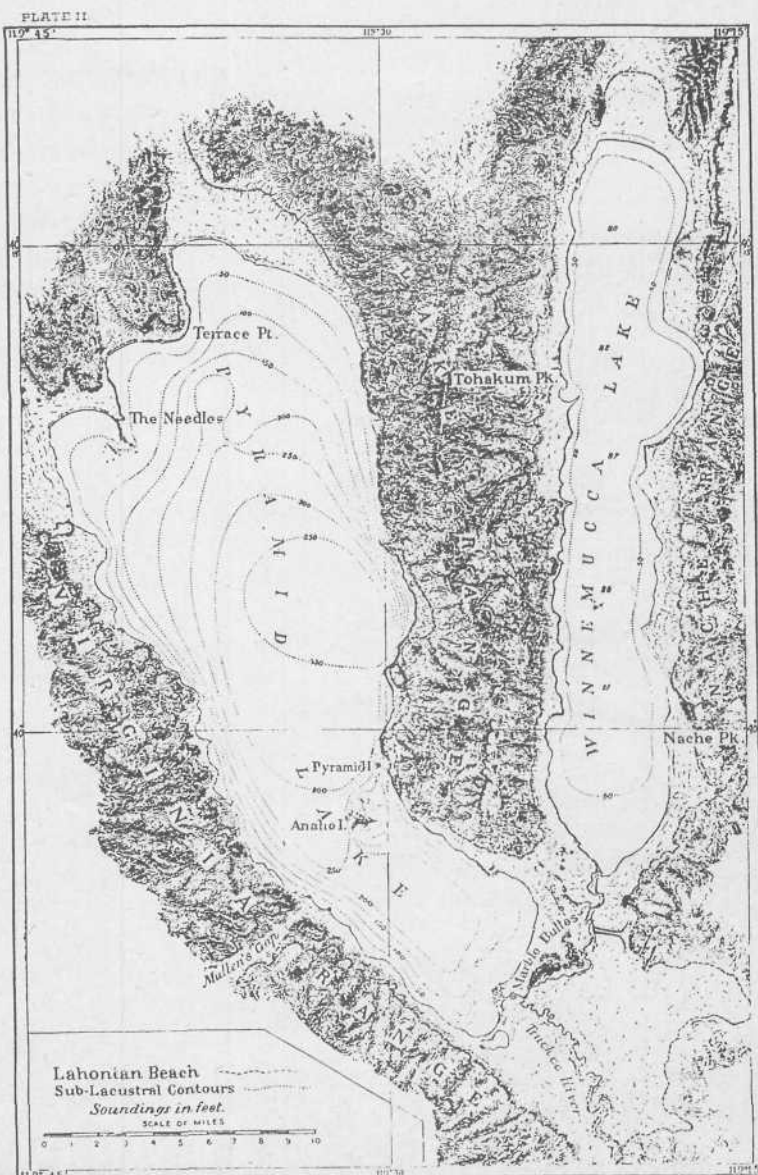
The year 1928 saw the last significant flow of Truckee River water into Winnemucca. There was not another until 1937 — and that small discharge was the last one ever. The next year an earth fill for the Nixon-Gerlach highway was plowed across Mud Slough, eliminating any further flow through the channel.

The elevation of the lake dropped rapidly. In four years, from 1935 to 1939, its surface receded 12 feet and it became practically dry. From that time on, Winnemucca Lake, which at its greatest extent in modern times covered some 60,000 acres and stood to a depth of over 80 feet, has held water only briefly in wet seasons. Its level expanse, while beautiful and impressive, usually offers the uninitiated visitor no hint of its watery past.

Today, as the 20th century wanes, Pyramid's lost sister lies silently and patiently in the desert sunlight, waiting for her errant sibling to join her.

*E. P. Osgood
[above] was
one of those
who monitored
the death of
the lake in the
1930s. Photo
Nevada
Historical
Society.*

*Lakes
Pyramid and
Winnemucca
in the 1880s.
From Israel
C. Russell,
Present and
Extinct Lakes
of Nevada
[1895].*



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The long idle Waterman mine is private property, posted against trespass, and dangerous because of deep shafts. Photo by Harold O. Weight.

THE MINE LEE LOST

Continued from Page 11

mine, it will be a strong point in favor of the heirs and give them their opportunity to establish their claim to one of the most valuable mines in California."

At the time of the inquest, presided over by son-in-law Rice, the *Index* reported: "The body is brought in in exactly the condition it was found. A gray blanket surrounded the mass, while a woman's skirt was folded around the body, next to the clothes . . . Testimony by several of the witnesses was that the skull resembled that of Lee and a dentist stated the teeth were also similar to those of Lee . . . Most important evidence given was by one Campbell, who said that a man by the name of Hoffman told him that old man Lee lay within 200 yards of Old Woman's Springs, with his head smashed in with a rock on the right side and wrapped up in a blanket in a hole six feet deep and covered over level and burnt by fire on top. Campbell went with Hoffman to the place indicated and found the body as described."

Verdict of the coroner's jury was that the remains were of a human being, name and sex unknown, and that death resulted from a blow on the head inflicted by some unknown person."

Hoffman was indicted by a San Bernardino grand jury and brought to trial amid rumors that he had been hired by Waterman to track Lee, that he had been hired by Waterman to kill Lee, that Waterman was paying for his defense. Doctors testified the pelvic bones were those of a female. San Bernardino County's Sheriff believed the pelvic bones had been substituted. Friends said the few gray hairs looked like Lee's. An Indian testified the skeleton was his mother's, and she had died a natural death.

"The evidence is very conflicting," said the *Riverside Press & Horticulturist*, "as to whether the remains are those of Lee or not and probably more so as to whether the murder was committed by Hoffman." The jury must have felt the same way. On September 7, 1883, after being out 19 hours, it remained divided, six for conviction, six for acquittal, and was dismissed. The *Riverside* paper said the case would be retried. Another account said charges were dismissed.

A month later, the State Supreme Court affirmed the decision of the Superior Court in the Lee-Waterman case. Waterman was confirmed in his ownership of the silver mine. There was no further mention of a Lee murder or a Hoffman trial.

During the litigation, Waterman had

continued development of his mine. In October, 1881, operations started at the ten stamp mill he had built on the Mojave at Grapevine, which became the town of Waterman. In May, 1882, the mill was shipping \$3000 to \$5000 a week in bullion. Two shafts, which would eventually reach 300 and 400 feet were going down. Crews at mine and mill were increasing. A school became necessary at Waterman.

Waterman, now with time and money available, became interested in politics. In 1886, he was the Republican nominee for Lieutenant-Governor of California.

And on October 22, 1886—two weeks before the general election—George Lee, his Pencil Lead mine and his lost ledge and his probable fate, coupled with miscellaneous alleged Waterman crimes and misdemeanors, were spread over most of the front page of the San Francisco *Examiner*. A series of headlines, extending down a third of a column, give an idea of the content:

“GEORGE LEE—The Mysterious Murder that Enriched R. W. Waterman—A Bloody Tale from San Bernardino—How the Owner of a Rich Mine

Disappeared—His Self-Accused Assassin Befriended by Waterman—Who Takes Possession of the Dead Man's Property—A Handy Son-in-Law for Public Administrator—The Finding of a Lonely Grave Under a Campfire—And the Handy Son-in-Law Officiates as Coroner—The Ghastly Story of a Mutilated Skeleton—Waterman Beats the Heirs, Defends the Murderer and is Nominated for Lieutenant-Governor.”

To which the *Riverside Press & Horticulturist* responded:

“The facts are that years ago Mr. Lee disappeared and was never heard of again. A long time after his disappearance Mr. Waterman discovered the abandoned mine and took possession of it. A long time after this discovery the skeleton of a man or woman was found on the desert and an attempt was made to show that this missing skeleton was Lee and that Mr. Waterman was connected with his disappearance, but the story was too thin to cast a cloud on the character of Mr. Waterman. Had Mr. Waterman not been nominated for office this story would never have been thought of again.”

Either the story backfired in sympathy for Waterman, or the voters ignored it. Democrat Washington Bartlett was elected Governor—but so was Waterman as Lieutenant-Governor. Waterman got a larger vote than Bartlett, ran 10,000 votes ahead of the Republican candidate for Governor—and for the first time in its history California had its two top officials from opposing parties. And when Bartlett died about eight months later, Waterman became Governor.

The Waterman mine shut down in 1887—the same year he became Governor—it is said because of a drop in the price of silver. Remaining in the hands of the Waterman family it has seen only small production since, principally from working of the tailings. Today it is closed, posted against entry, and deadly dangerous because of shafts and open cuts. The great silver mine which produced \$1,700,000 and a California governor also is almost forgotten. So is the fact that George Lee discovered it.

But the phantom ledge he may have found, and which has produced nothing but legends, is alive and well—somewhere “in the eastern Mojave.” □



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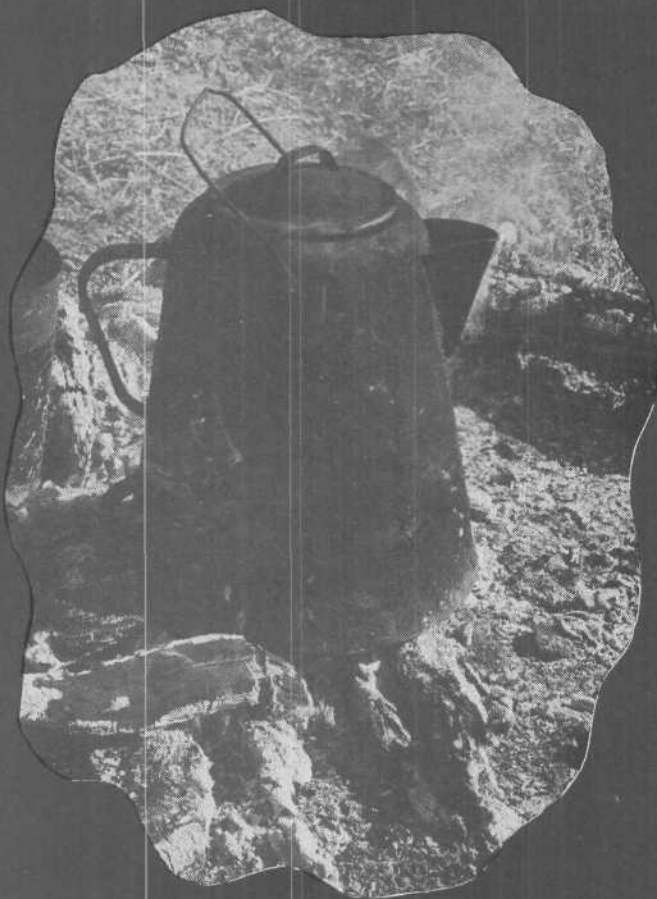
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What's Cooking on the Desert?

by STELLA HUGHES



Ox-Tail Stew!

ONE NIGHT this past winter my husband and I were invited to supper by our neighbors. Our hostess warned us in advance she wouldn't go to a lot of

trouble, and would simply be serving stew. What she failed to tell us, however, was that supper was ox-tail stew, and proved to be out-of-this-world delicious and satisfying on a cold winter's night.

I mentioned this certain stew to a young home-maker friend, who is urban to the extreme. She threw up her manicured hands in horror and exclaimed, "Yuck! It must have been horrible."

I explained about ox-tails and other soup bones making great meals when done the right way, and told her how economical they were.

This evidently touched a sore spot with her, for she said, "If you'll shut up, I'll try ox-tails *once*. Our grocery bill is so high because I buy only the choice cuts of steaks and roasts. I really don't know how to cook variety meats or the cheaper cuts."

My friend went out and bought several pounds of ox-tails. She told me, with a grin, she was willing to start at the bottom and work up. After one supper of ox-tail stew, she and her husband became converts. Well, almost. She's promised to try baked heart next, and maybe sweetbreads for breakfast *sometime!*

Ox-tails aren't from oxen anymore, but are from beef cattle. Somehow it still seems best to cling to the old time name, as cow-tails or bull-tails just might turn a person off. But any old way you call them, they mean economy. There's few bargains left these days, but ox-tails for stew is still one of them.

It takes about a pound of ox-tails per serving. The joints are gelatinous and when braised and simmered by low heat for several hours, produce a rich and flavorful broth. Braising usually means searing meat in a small amount of fat until nicely browned. Then cooking with a small amount of liquid in a covered container until tender. Simmering a long time changes the tough connective tissue to gelatin which is soluble in water. Just be sure you do not boil the meat at high heat, as it is the slow simmering that is so essential for making good ox-tail stew.

Vegetables should not be added until the meat is almost done. Naturally, vegetables that require a longer cooking time should be added first, and those that take a shorter time, later.

Ox-tail Stew

Trim excess fat from five pounds of ox-tails cut in pieces about two inches long. Salt and pepper. Sear both sides in hot fat in a heavy iron skillet or Dutch oven. When all are browned sprinkle with flour. Add one large onion diced, one clove of garlic and one teaspoon red chili

powder. Add about six cups of beef stock and one cup of red wine. Some parsley sprigs and one branch of celery will add to flavor, along with one-half teaspoon thyme. Cover and simmer for at least three hours. Vegetables in the way of small whole carrots, small potatoes and turnips (if desired) should be added about a half hour before serving. Other variations are adding mushrooms and canned tomatoes.

You might not see ox-tails in your butcher shop showcase, but if you ask for them, generally they are available. A very good substitute for ox-tails are beef shanks. Beef shanks are about as low down on the hock as you can get. You'll discover good old-fashioned flavor in simmered beef shanks, and besides real good eating enjoyment, they won't strain the budget.

Beef Shanks Pot Roast

- 3 pounds of crosscut beef shanks
- 1½ tablespoons bacon drippings or other shortening
- 2 cups tomato juice
- salt and pepper, fresh parsley and 1 teaspoon dry basil, crushed

Combine one-half cup flour, salt and pepper in a brown paper bag; add beef shanks and shake well until all are coated. Braise floured meat in hot fat in Dutch oven. Add potatoes and other vegetables as desired. Simmer another 30 or 40 minutes, or until vegetables are done. Then remove meat and vegetables from Dutch oven, add enough water to make at least two cups liquid; thicken with flour to make gravy. Pour over meat and vegetables or serve separately.

The appeal of stew is universal—almost every country has its own form of this cookery. The French call it *ragout* and in Italy beef stew become *Stufatino alla Romana*, and in America a famous stew called Mulligan (variations depending on the cook and ingredients at hand) is known from Canada to the Mexican border.

Mulligan can be whipped up in a flash, whether it is in a cowcamp, hunter's tent or a rockhound's motor home. Basically you'll need one can of meat (corned beef, Spam, ham, etc.), then add as fast as you can wield the can opener, one can of tomatoes, one can of corn, one of peas and any other canned vegetables that comes to hand. Heat in a skillet or stew pan and dig in! If there's a great big empty space in your stomach, it'll taste wonderful! □



Young Costa's Hummingbird



Living Desert Reserve Hotline

by KAREN SAUSMAN

THE LILIAN CHASE AVIARY

Aviaries have traditionally been designed to be viewed from the outside. The Living Desert Reserve has just completed construction of the 100-foot-long, 50-foot-wide and 20-foot-high Lilian Chase Aviary that allows visitors to walk inside and be with the birds. While there are several walk-through aviaries in Southern California, the Reserve's is the first to have been built to especially house native desert birds.

The re-creation of a desert oasis, complete with water and palm trees, filled with native song birds, has been the dream of Karen Sausman, the Director of Living Desert Reserve, for several years. Nearly two years ago, Lilian Chase, a Docent and volunteer in the Animal Department of the Living Desert Reserve, asked her when the Reserve would start construction on the Aviary. When she was told that the Reserve was waiting to find the necessary funds, she replied that she and her husband would like to underwrite the project.

The initial design of the Lilian Chase Aviary was done by Zoo Plan Associates of Wichita, Kansas, a consulting firm that does nothing but design facilities for zoological parks and aquariums. The engineering of the Aviary was completed by Mr. Joseph Sheffet of Indian Wells, California.

The final design of the Aviary called for it to be a tent-like structure supported by two central 22-foot-tall poles. Heavy cables were stretched from the top of the poles to the ground. The cables were anchored in the ground with blocks of concrete up to seven cubic feet in size. The whole Aviary is held in place by tension of the

various cables. Using the cables as a frame work, one-inch by half-inch galvanized wire mesh was used to cover the entire structure.

Landscaping the Aviary and adjacent area had to begin before the mesh was placed on the Aviary because of the need to use a crane to place large trees and boulders inside the structure. Two wire-coated double door entries allow access into the Aviary.

After the wire mesh was stretched onto the structure the whole thing was painted dull black so that the wire would blend into the surrounding vegetation. Then the work of landscaping the area was able to really begin. A desert oasis was recreated including large Washingtonia fan palms, mesquite palo verde and desert willow. A stream issues forth from a rock face and meanders through the Aviary and down a streambed into a pond. Altogether the Aviary and oasis plantings flow over nearly an acre of area within the Reserve's James Irvine Gardens.

When the Aviary opened on April 7, inhabitants included dove, quail, finches and blackbirds. Ultimately the Aviary will house nearly 20 species of birds. The wire mesh is fine enough to hold hummingbirds, warblers, orioles and wrens as well as quail and dove. Initially, however, the Aviary can only maintain a dozen individuals because the plantings are young and fragile.

Even though the Lilian Chase Aviary and the oasis plantings will take several years to mature, the area is already very attractive and restful. Running water murmurs and bubbles through the streambed and large palm trees cast cool shade over the landscape. The whole area is a pleasant place to come and sit and enjoy the birds.

The Living Desert Reserve in Palm Desert, California is open September to June from 9:00 to 5:00 P.M. daily. □

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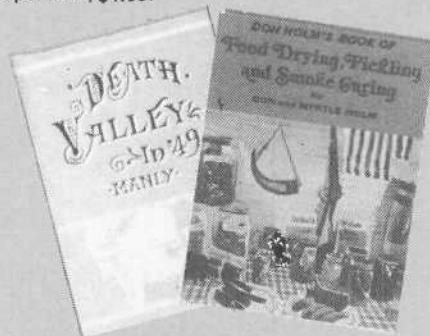
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Another Opinion . . .

In the April issue of *Desert Magazine*, the author of "On the Other Side" alludes to a microcranium perception in condoning the penalizing of the law abiding ORVers with unnecessary restrictions because of abuses by the licentious.

Conversely we should accept this irrational analogy to promote similar restrictive use of areas in cities where the criminal element is rampant in lieu of bringing the malfeasants to task. Such ludicrous nonsense!

I reject Mr. Wilkinson's criteria in determining "good-guy" ORVers i.e. they either live in the desert and/or are members of an ORV club. A myopic conclusion, indeed.

We who love the desert but are not fortunate enough to live there, yet treat it with respect, surely must be in the majority. Those who do live there should realize that their homes, towns and cities, with all their amenities including golf courses and tourist-oriented businesses, have been built on pristine lands.

There are sufficient desert land-use laws that need to be enforced, but let us not allow hysterical reasoning to conclude that a fence around Death Valley or wherever (the next illogical restriction) will deter the offenders.



Calendar of Events

This column is a public service and there is no charge for listing your event or meeting—so take advantage of the space by sending in your announcement. We must receive the information at least three months prior to the event.

MAY 5 & 6, Delvers Gem & Mineral Society's 29th Annual Show. Displays, Demonstrations, dealers (closed), free parking and admission. Bellflower Women's Club, 9402 Oak Street at Clark Street, Bellflower, Calif.

MAY 5 & 6, 14th Annual Antique Bottles and Collectables Show and Sale, Scottish Rite Memorial Center, Interstate 8-Mission Valley, San Diego, Calif.

MAY 5 & 6, Tourmaline Gem and Mineral Society's 30th Annual free Gem Show, "Nature's Beauties," Helix High School, 7393 University Ave., La Mesa, Calif. No Dealers.

MAY 5 & 6, Art Festival, sponsored by the Antelope Valley Allied Arts Assoc., Antelope Valley Fair Center Hall, Lancaster, California. Free admission.

MAY 5 & 6, Second Annual Hi Desert Escapade—an escape to the desert for the whole family. Many activities, tours, displays. Contact the Ridgecrest, California Chamber of Commerce for further information on special events, lodging and camping facilities. P. O. Box 771, Ridgecrest, Calif. 93555. (714) 375-8331.

MAY 5 & 6, Million \$ Gem Show, Los An-

Penalize the abusers—not the innocent majority.

BOB PIERUCCI,
Stockton, California.

Save a Depot . . .

I am enclosing two photos with this letter. One is of the Nye County Courthouse which was built in 1874 at Belmont, Nevada. I took this photo while in Belmont last April. I want people to know they are doing a beautiful job of restoring this building.

The second photo is of the old depot in Rhyolite, which at the time of its construction in 1906 served three railroads: the S.P., A.T., and the S.F., and was the most elaborate depot in Nevada. At this time, there is not another railroad within 100 miles of this old ghost town.

I am wondering is there being anything done about restoring this beautiful old building. With all the history it represents, surely something should be done, as there are numerous historic places all over the country being restored. This building should also be restored.

THOMAS S. McCLAIN,
West Jordan, Utah.

geles County Fairgrounds, Pomona, Calif. Building 22. Free parking and tram service. Admission \$2.00 for adults, 75c children 12-16. Under 12 free. Dealers, exhibits, games and demonstrations.

MAY 12 & 13, Searchers Gem & Mineral Society's 20th Annual Show. Brookhurst Community Center, 2271 West Crescent Ave., Anaheim, Calif. Free admission and parking. Dealer space filled.

May 12 & 13, Mission Peak Gem & Mineral Society's 13th Annual Show, Irvington High School, Blacow Rd., at Grimmer Blvd., Fremont, California. Special exhibits, demonstrations. Dealer space filled.

MAY 12 & 13, Searchers Gem & Mineral Society's 20th Annual Show, "Searchers Gem Roundup," Brookhurst Community Center, 2271 West Crescent Ave., Anaheim, Calif. Free admission and parking.

MAY 12-20, 53rd Annual Wildflower Show, sponsored by the Julian Woman's Club, lower floor of the Julian Town Hall, Julian, Calif. No admission charge. An Art Show, sponsored by the Julian Chamber of Commerce will run concurrently with the Wildflower Show.

MAY 19 & 20, Yucaipa Valley Gem and Mineral Society's 14th Annual Show, Community Center, first Street and Avenue B., Yucaipa, Calif. Demonstrations, exhibits, free parking and admission.

MAY 19 & 20, 16th Annual presentation of the "World of Gems" by the Berkeley Gem & Mineral Society, Activities Building of the Contra Costa College, 2600 Mission Bell Dr. San Pablo, Calif. Exhibits, dealers. Show benefits a Scholarship that provides two grants. Ample parking space for campers and trailers.

MAY 24, "Spring-Time Fantasy," sponsored by the Reno-Sparks Garden Clubs, Centennial Coliseum. Admission free. Public invited to enter the horticultural and artistic arrangement division.

MAY 26 & 27, 1979, Verde Valley Gem & Mineral Show, Mingus Union High School, Cottonwood, Arizona. Sponsored by the Oak Creek Gem & Mineral Society of Sedona, Arizona and Mingus Gem and Mineral Club of Cottonwood, Arizona. Dealer space filled.

MAY 26 & 27, Newberry Springs Art Club Annual Art Show, Community Center, Newberry Springs, Calif.

JUNE 2 & 3, 13th Annual Rockatomics Gem and Mineral Show, 8500 Fallbrook Ave., Canoga Park, California. Exhibits, dealers, Demonstrations. Admission and parking free.

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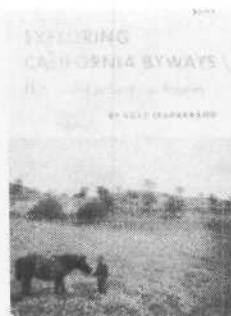
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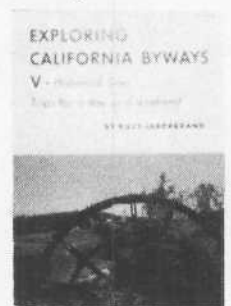
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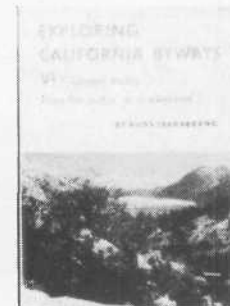
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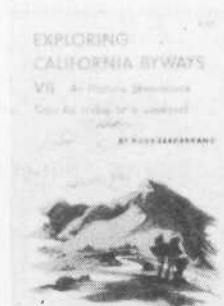
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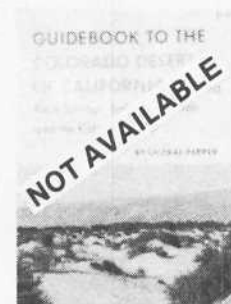
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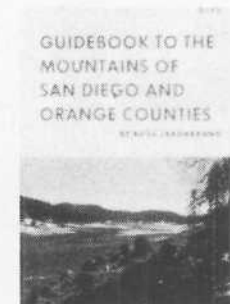
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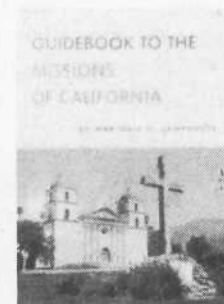
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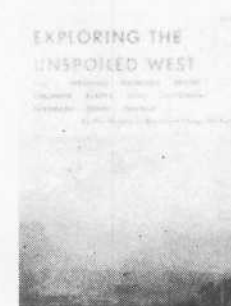
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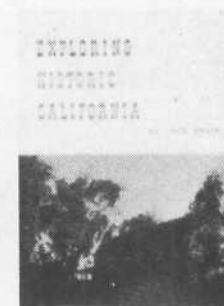
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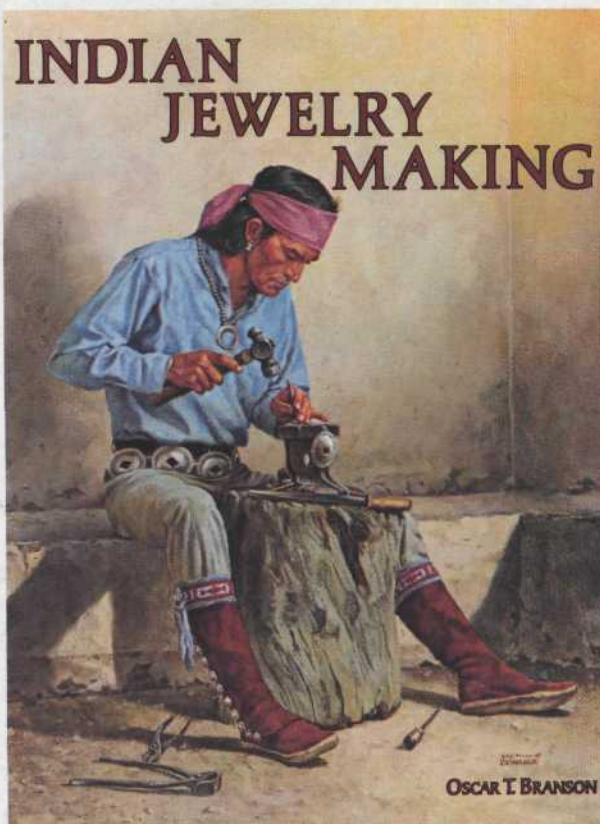
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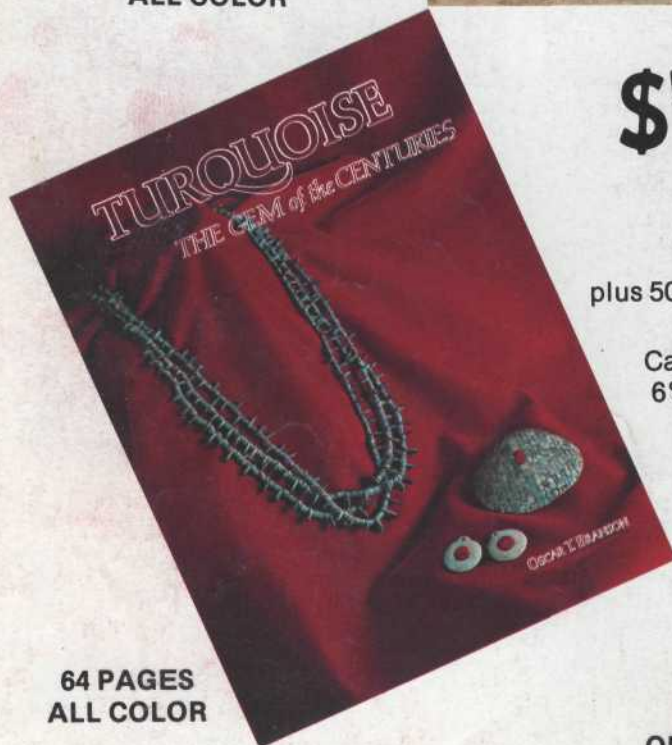
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